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THE RELATIONSHIP OF PARENTING WITH ADOLESCENT
PROBLEM BEHAVIORS AND HEALTHY DEVELOPMENT: AN APPLICATION
OF A MOTIVATIONAL MODEL OF DEVELOPMENT

by

SHARON ANN JOHNSON

A dissertation submitted in partial fulfillment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY
in
SYSTEMS SCIENCE: PSYCHOLOGY

Portland State University
2004

DISSERTATION APPROVAL

The abstract and dissertation of Sharon Ann Johnson for the Doctor of Philosophy in Systems Science: Psychology were presented April 12, 2004, and accepted by the dissertation committee and the doctoral program.

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ABSTRACT

An abstract of the dissertation of Sharon Ann Johnson for the Doctor of Philosophy in Systems Science: Psychology presented April 12, 2004.

Title: The Relationship of Parenting with Adolescent Problem Behaviors and Healthy Development: An Application of a Motivational Model of Development

This study explores the relationship between parenting and adolescent outcomes within the context of healthy adolescent development. A motivational model of development provides a framework for understanding adolescent and parent behaviors.

Participants in the study were 4,090 students in grade 8-12. Students' self-reported behaviors and perceptions of their parents' behaviors were collected as part of a statewide school survey.

The study contributes to the understanding of parenting dimensions that underlie parenting styles through the identification of six parenting dimensions (warmth, structure, autonomy support, rejection, chaos, and coercion) that correspond to the motivational model. In addition, monitoring is identified as a seventh dimension of parenting and found to have an important influence on adolescent

behaviors and outcomes. Further, it is demonstrated that parenting dimensions combine to form a set of seven parent types that are differentially associated with adolescent outcomes and problem behaviors. Means on positive adolescent outcomes (academic competence, commitment to school, social competence, self-worth, and mastery), substance use, and problem behaviors suggested an ordering of parent types. Adolescents with authoritative parents experienced the best outcomes followed by warm authoritarian, permissive, authoritarian, mediocre, rejecting, and indifferent parents.

This study also sought to understand the effects of alcohol and marijuana use on adolescent competence. Consistent with other studies that have noted detrimental effects of early alcohol and marijuana use, this study indicated that for 8th graders, any trial of alcohol or marijuana was associated with significantly ($p < .01$) lower levels of overall competence. For grades 9-10, triers of alcohol were not significantly less competent than nonusers. For grades 11-12, triers of alcohol and triers of marijuana were not significantly less competent than nonusers. These findings partially support Baumrind's (1991) findings. A search for differences in parenting that might distinguish between triers and more frequent users of alcohol and marijuana indicated that parental monitoring of adolescents was higher among triers than among more frequent users.

A third aim of this study was to better understand the mechanisms through which protective factors influence problem behaviors. Findings indicated that parental warmth moderates the relationship between risk factors and problem behaviors.

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Chapter 1

Introduction and Overview

Because of the threat posed to successful development and cost to society, adolescent problem behaviors have become the focus of substantial concern. Problem behaviors, such as drug and alcohol use, speeding, engaging in unprotected sex, and a variety of delinquent activities such as fighting, theft, and vandalism, have the potential to create immediate as well as future problems for adolescents (Allen, Aber, & Leadbetter, 1990). For example, drug and alcohol use may undermine motivation, interfere with cognitive processes, and increase the adolescent's risk of accidental injury or death. In adulthood, drug and alcohol use which began in adolescence may increase the risk of lung cancer and heart disease and lead to shortened life (Hawkins, Catalano, & Miller, 1992).

The pervasiveness of adolescent problem behaviors is also cause for concern. Arnett (1992) reported that over 50% of adolescents have driven under the influence of alcohol, had sex without contraception, used illegal drugs, or engaged in some type of illegal activity such as vandalism, shoplifting, or fighting. This pervasiveness has led some researchers to suggest that problem behaviors may be functional for adolescent development (Arnett, 1992; Barber, 1997a; Baumrind, 1987, 1991; Jessor, 1991). According to the contemporary view, establishing identity and developing autonomy from parents while maintaining an appropriate degree of relatedness or connection with

the family are among the primary developmental tasks of adolescence (Allen, Hauser, Bell, & O'Connor, 1994; Hill & Holmbeck, 1986; Steinberg, 1990). During this developmental stage, the importance of relationships with peers and interest in romantic relationships increase. Engagement in problem behaviors such as alcohol and substance use may be functional in validating independence, gaining peer recognition, exploring identity, and testing ability to handle one's self in a variety of situations.

Although a majority of adolescents experiment with some problem behaviors, only a few go on to engage in more serious illegal behaviors or become alcohol and drug abusers. This is not intended to minimize the seriousness of these adolescent behaviors. Certainly, teen pregnancy, drug and alcohol use, and other problem behaviors represent serious risks to successful development. The point to be made is that most adolescents engage in at least some activities that could be considered problem behaviors. The challenge is to discover whether there is some level of engagement in problem behaviors that triggers poor outcomes.

Much of the research addressing adolescent problem behaviors has focused on risk and protective factors (see Hawkins et al., 1992 for a review; Catalano & Hawkins, 1996; Jessor, Van Den Bos, Vanderyn, Costa, & Turbin, 1995). The concept of risk and protective factors emerged from research in psychopathology (Garmezy & Masten, 1986; Rutter, 1987). Risk factors were defined as those variables that increase the probability of undesirable outcomes. Protective factors were defined as those variables or conditions that moderate or ameliorate the relationship between risk factors and undesirable outcomes. Garmezy and Rutter observed that many children at risk for

psychopathology never experienced the consequences. This observation led to a search for potential buffers or protective factors which might moderate the relationship between risk factors and child outcomes. The risk and protective factor framework has been extended from its original focus on psychopathology to include alcohol and drug use and delinquent activities such as theft, vandalism, and fighting (Jessor et al., 1995).

A variety of risk factors for problem behaviors in adolescence have been explored. Among these are contextual or environmental factors, family and individual factors, and behavioral factors (see Hawkins et al., 1992 for a review; Hawkins et al., 1998; Jessor et al., 1995). Contextual factors that contribute to adolescent risk for problem behaviors include laws and norms favorable toward the behaviors, availability of alcohol and other drugs, extreme economic deprivation, and neighborhood characteristics. Relevant neighborhood characteristics include density, mobility, physical deterioration, low attachment to the neighborhood, and crime rates. Family factors which increase adolescent risk for problem behaviors include abuse of alcohol or other drugs by family members, family conflict, poor and inconsistent disciplinary methods, and low bonding to the family. Individual risk factors include low expectations for success, low self-esteem, deviant peers, and poor academic performance. Behaviorally, the early onset of problem behaviors predicts continued engagement in problem behaviors. Similarly, engagement in one problem behavior is frequently predictive of engagement in other types of problem behaviors. For example, youth who are frequent users of alcohol have greater risk of engaging in delinquent activities such as theft, vandalism, and fighting (Jessor, 1987, 1991).

Although the literature has generated a lengthy list of risk factors, there appears to have been less focus on protective factors and the mechanisms through which they operate. Catalano and Hawkins (1996) and Hirschi (1969) proposed that parental involvement and family bonding operate as potential protective factors, but research has not been conducted to determine whether parental warmth and involvement moderate the relation between risk and adolescent outcomes.

Although there is little evidence that individual protective factors moderate the relationship between risk factors and problem behaviors, Jessor and associates (1995) demonstrated that a composite protective-factor score moderated the relationship between risk factors (also a composite score) and an index of multiple problem behaviors. The protective score included: positive orientation to school, positive orientation to health, intolerance of deviance, positive relationships with adults, perceived regulatory controls, friends as models for conventional behavior, and prosocial activities. The findings indicated that the relationship between risk factors and problem behaviors depended on the presence of protective factors. Among adolescents with similar numbers of risk factors, those with a greater number of protective factors engaged in fewer problem behaviors than did adolescents with fewer protective factors. Thus, it was concluded that the presence of factors such as a positive orientation to school and positive relationships with adults protect youth from influences such as having deviant peers and living in conditions of extreme poverty.

The Role of Parenting

Parenting has been implicated in both positive and negative adolescent behaviors and outcomes. Parental warmth and involvement have been positively associated with academic performance (Herman, Dornbusch, Herron, & Herting, 1997; Otto & Atkinson, 1997; Paulson, 1994), competence (Papini & Roggman, 1992), ego development, and self esteem (Allen et al., 1994). Discipline and parental monitoring have been identified as particularly important variables in predicting problem behaviors. Lack of or inconsistent discipline, disciplinary techniques such as guilt which infringe on psychological autonomy, and insufficient monitoring have been associated with drug and alcohol use, delinquent activities, and depressive symptoms in adolescents (Barber, 1996; Barber, Olsen, & Shagle, 1994; Hawkins, Catalano, & Miller, 1992; Patterson & Stouthamer-Loeber, 1984). In discussing adolescent substance use, Hawkins et al. (1992) concluded that “the risk of drug abuse appears to be increased by family management practices characterized by unclear expectations for behavior, poor monitoring of behavior, few and inconsistent rewards for positive behavior, and excessively severe and inconsistent punishment for unwanted behavior.” In contrast, discipline methods that include clear requirements for responsible behavior have been associated with lower levels of drug use (Brook et al., 1990).

Many of the studies that have examined the relationship between parenting and adolescent behaviors have employed parenting typologies (Baumrind, 1971; Maccoby & Martin, 1983) and determined that certain parenting styles were associated with specific outcomes. An alternative approach would be to identify the particular dimensions of

parenting that combine to define a particular typology and to explore their relationships with adolescent behaviors and outcomes. Recent work by Barber (1997a) and Herman and associates (1997) have argued for unpacking parent typologies in an effort to identify the specific parenting dimensions that correlate with a variety of outcomes. They argued that understanding the contributions of each of the dimensions of parenting will aid in developing interventions to reduce the prevalence of adolescent problem behaviors and encourage optimal development.

The purpose of this study is to explore the relationship between parenting and adolescent behaviors within the context of healthy development. The focus of the research is on adolescents' perceptions of their parents and adolescents' self-reported behaviors. A survey of adolescents in grades 8 through 12 was conducted to explore adolescents' perceptions of parenting and the relationships between those perceptions and a variety of adolescent outcomes. The following research questions were addressed: Are there six distinct parenting dimensions (i.e., warmth, structure, autonomy support, rejection, chaos, and coercion) or are there three bipolar dimensions (warmth vs. rejections, structure vs. chaos, and autonomy support vs. coercion)? How are parenting dimensions related to adolescent outcomes? Are varying combinations of parenting dimensions associated with differential outcomes for adolescents? Since it has been suggested that some engagement in problem behaviors may be functional for adolescents, is there some level of engagement in problem behaviors that does not appear to undermine adolescent functioning? Are patterns of parenting different for adolescents who are regular alcohol and marijuana users versus those who are not? Do

warmth, structure, and autonomy support protect adolescents from risk factors such as having friends who use drugs?

Before presenting the details of the research, the literature addressing parenting and adolescent outcomes is reviewed. This review is organized around a motivational model of development based on psychological needs for relatedness, competence, and autonomy. Chapter 2 presents the motivational model and proposes that a major task for parents is to create a social context in which adolescents can seek experiences to meet their psychological needs. A discussion of the larger environment highlights the multiple influences on adolescent behaviors.

Chapter 3 reviews the literature exploring the relationships between dimensions of parenting and adolescent outcomes. The chapter is organized around the themes identified by the motivational model (i.e., warmth, structure, and autonomy support). The adolescent outcomes associated with parental warmth versus rejection, provision of structure versus chaos, and autonomy support versus coercion are discussed.

Chapter 4 reviews the relationship between Baumrind's (1971) parent typology and adolescent outcomes. The adolescent behaviors that are associated with authoritative, authoritarian, indulgent, and neglectful parenting styles are discussed. An expanded parenting typology based on Baumrind's (1991) more recent work with adolescents is also presented.

Chapter 5 provides an overview of why this study was conducted and a review of the methodology.

Chapters 6 through 9 present the research results. Chapter 6 includes a description of the development of the parenting dimension measurement model, explores whether three or six dimensions underlie parenting style, and examines how these parenting dimensions are related to adolescent behaviors and outcomes. Chapter 7 identifies seven groups of adolescents based on their perceptions of their parents' behaviors, describes those parent types, and explores whether particular parent types are related to particular adolescent outcomes. Chapter 8 takes a close look at adolescent alcohol and marijuana use and its relationship with overall adolescent competence and perceived parenting. Chapter 9 reports findings from an analysis aimed at determining whether positive parenting dimensions (parental warmth, structure, autonomy support, and monitoring) serve as protective factors that moderate the effects of environmental risks for adolescent problem behaviors.

Finally, Chapter 10 provides a summary and discussion of findings. The chapter concludes with a discussion of the limitations of the current study and some ideas for future research.

Chapter 2

Self-System Processes

Over the past 50 years, researchers have explored the dimensions underlying variations in parenting styles. Consistent with Darling and Steinberg (1993), parenting style is used here to refer to the overall gestalt, or general milieu, of parenting attitudes, practices, and behaviors that contribute to the context of parent-child interactions. Although a variety of labels and methodologies have been used, three general dimensions of parenting have emerged (Barber, 1997a; see Maccoby & Martin, 1983 for a review; Schaefer, 1965; Steinberg, 1990):

- (1) The first is a dimension representing parental warmth and involvement. This dimension has been studied under a variety of labels including warmth versus hostility, acceptance versus rejection, attachment, involvement, and connectedness.
- (2) A dimension dealing with parental attempts to regulate child behaviors has been studied as restrictive versus permissive, firm control versus lax control, regulation, monitoring, and behavioral control.
- (3) A third dimension has emerged representing parental support for the child's autonomy versus use of psychological control or democracy versus autocracy. These three dimensions have been repeatedly associated with healthy child development and recur throughout the literature on parenting (Barber, 1997a; Maccoby & Martin, 1983; Skinner & Wellborn, 1994; Steinberg, 1990).

A Motivational Model of Development

The recurrence of these themes in the parenting literature corresponds with a motivational model of human development that posits basic psychological needs for relatedness, competence, and autonomy (Connell, 1990; Connell & Wellborn, 1991; Skinner & Wellborn, 1994). The theory proposes that the developing individual actively engages in the construction of the self through interaction with the environment. The individual seeks experiences which will fulfill basic needs for relatedness, competence, and autonomy. The task for parents, schools, and others involved with the socialization of children is to provide an environment in which these basic needs can be met.

Relatedness refers to the need for close personal relationships and feelings of belonging. Relatedness has been studied during infancy under the label of attachment (Ainsworth, 1979) and as warm, nurturing relationships between children and their parents (Maccoby & Martin, 1983). The developing child may experience the environment as warm and loving, neglectful, or rejecting. Parental warmth provides the developing child with feelings of safety and facilitates the internalization of parental values. If parents are perceived as neglectful or rejecting, the child may fail to learn to trust and self-esteem may suffer.

Competence refers to the need to be effective in achieving desired outcomes and in avoiding undesirable ones. The child learns to feel competent in an environment in which parental response is contingent on child behavior (Maccoby &

Martin, 1983). According to the motivational theory (Connell & Wellborn, 1991; Skinner & Wellborn, 1994), the child can experience the environment as providing structure or as chaotic. Components of structure include clear expectations for behavior, consistency, contingent responsiveness, and information about how to obtain desired outcomes. If the child does not know what is expected and rules are not consistently applied, the environment is likely to be experienced as chaotic and unpredictable. In a social context that provides structure, the child can develop a sense of personal efficacy and competence.

Autonomy refers to self-determination of one's actions. Autonomous actions are freely chosen and intrinsically motivated. Autonomy support is provided when children are granted freedom of expression, choice, and respect (Skinner & Wellborn, 1994). Other important contributors to autonomy support are rationales for rules and acknowledgment of children's feelings. Children can experience their environments as autonomy supportive or coercive. Coercion occurs when the child is manipulated, constrained, and overly controlled. Impinging on a child's psychological autonomy has been associated with adolescent problem behaviors and with failure to internalize parental values (Barber, 1997a).

In a social context that provides warmth, structure, and autonomy support, the child can engage in experiences which provide feelings of relatedness, competence, and autonomy. The child continuously appraises these feelings to determine how well his or her basic psychological needs are being met. These appraisals are called self-

system processes. When a need is challenged or insufficiently fulfilled, the child seeks experiences to fulfill the need (Connell & Wellborn, 1991; Skinner & Wellborn, 1994). It should be noted that the appraisals for relatedness, competence, and autonomy are simultaneous and comprise a dynamic system. The mix of desirable experiences changes over the course of development. Relatedness is of primary importance in infancy, competence is likely of greater importance in childhood, and establishing autonomy is of greater relative importance during adolescence. While Connell and Wellborn propose that the three basic needs may become aligned in a synergistic fashion and lead to engaged, concentrated effort, they also suggest that the three needs may, at times, come into conflict. For example, an adolescent may desire to establish independence from parents while at the same time want the safety and comfort of the family home. Thus, optimal development requires a balance of relatedness, competence, and autonomy.

Both child and parent actively construct self-system processes and contribute to one another's social context. A model of the reciprocal nature of parent-child interactions that incorporates self-system processes is displayed in Figure 1. The model emphasizes that the adolescent's perceived social context influences that adolescent's self-system. The self-system processes lead the adolescent to patterns of actions. The adolescent's patterns of action are a part of the parent's perceived social context which influences the parent's self-system processes and patterns of action.

Figure 2.1 The Reciprocal Nature of Parent-Adolescent Interactions

Adapted from Connell & Wellborn (1991).

Thus, while parenting practices influence adolescent behaviors, the model also indicates that adolescent behaviors influence parenting practices.

The Larger Environment - An Ecological Perspective

A systems perspective requires recognition that the adolescent's self-system processes are embedded within multiple systems. The adolescent not only interacts with parents, but with peers, school, neighborhood, and community. Not only are adolescents influenced by the systems with which they interact directly, but they are

also influenced by systems with which they have no direct contact. Bronfenbrenner (1977, 1986) noted the hierarchical nature of systems when he outlined the importance of adopting an ecological perspective in studying human development. An ecological perspective recognizes five levels of systems: the individual, microsystems, the mesosystem, the exosystem, and the macrosystem.

The perspective taken in this paper is that the individual comprises a system consisting of self-system processes or appraisals. The components of the self-system are the appraisals of whether basic psychological needs for relatedness, competence, and autonomy are being met. The attributes, or emergent properties, of the self-system are the actions of the individual that are motivated by self-system appraisals.

The immediate contexts within which the individual develops are microsystems. Microsystems for an adolescent might include family, school, peers, and neighborhood. The interactions between the adolescent and family form a microsystem, as do the interactions between the adolescent and peers, and interactions between adolescent and school, and so on.

The relationships among the microsystems form the mesosystem. The mesosystem is important in understanding that an adolescent's relationships with family, school, and peers are interconnected and influence one another. For example, the relationship between an adolescent and parent influences the relationship between the adolescent and peers. Parents' disapproval of an adolescent-peer relationship sometimes serves to strengthen the adolescent-peer relationship, particularly if the

adolescent perceives the peer relationship as outside of the parents' legitimate domain of influence.

The exosystem includes social structures that do not contain the developing child, but influence the immediate settings in which the child is found. The nature and requirements of parents' work, school boards, and parents' informal social networks provide examples. Parents' work demands influence parent-child relationships without direct involvement of the child in the parents' work place. Similarly, decisions by a school board may influence teacher-child and school-child relationships.

Finally, the macrosystem represents the larger cultural or subcultural setting in which the other systems are embedded. Cultural norms guide behavior and define cultural institutions, thus, forming an overarching system.

Viewing adolescence from an ecological perspective requires recognition that the environment within which self-system processes function includes hierarchical systems. For a thorough understanding of self-system processes one would need to consider warmth, structure, and autonomy support provided by parents, siblings, peers, school, and neighborhood and their multiple interactions (the mesosystem). The influence of higher level systems that might include the parents' work, the school board, and cultural practices would also need to be explored.

An important characteristic of an ecological perspective, or systems approach, is that we can change our perceptual stance and observe a lower or higher order system

(Lendaris, 1986). At the level of the adolescent, the self-system processes are the components of the adolescent system, while family, peers, and school contribute to the environment. A change in perceptual stance to the level of the family would make the parents and children the components of the system, and the parents' workplaces and children's schools, the neighborhood, and the church would become components of the environment.

It is also possible to shift perspectives in the horizontal direction (Lendaris, 1986). The purpose of this study is to gain a better understanding of the relationship between parenting and adolescent behaviors. Parenting styles might be studied from a variety of perspectives—child, parent, teacher, etc. Each perspective would provide somewhat different data. There is evidence that reports of parenting style made by adolescents and parents differ (Glasgow, 1997; Paulson, 1994). For example, parents tend to view themselves as more authoritative, a parenting style that emphasizes expressions of warmth for the child, clear rules and expectations, and encouragement of independence. In contrast, adolescents are more likely to view their parents as permissive (i.e., warm but making few behavioral demands) or as authoritarian (i.e., not particularly warm, but insistent that adolescents conform to behavioral standards) (Smetana, 1995). Since the current study focuses on adolescent outcomes and the motivational model posits that self-system processes motivate action, adolescents' perceptions of parenting were collected. It is recognized, however, that the design of

interventions to improve parenting will require the understanding of both parents' and adolescents' perceptions of parenting practices.

It is expected that adolescents' experiences of parenting that are characterized by warmth, structure, and autonomy support will promote positive adolescent development and protect the adolescent from the risks of engaging in substance use and other problem behaviors. Although this research examines parent-child relationships from the child's perspective, if the hypothesized relationships are confirmed, this research will provide the foundation for exploration of the larger system. To understand adolescent problem behaviors and to design preventive interventions, research will be needed to identify mesosystem and macrosystem influences and to incorporate perspectives of parents, school officials, and others who interact with adolescents.

Mesosystem influences. While parents have a major influence on adolescents, peer influence is increasing (Brown, Mounts, Lamborn & Steinberg, 1993). In addition, adolescents spend increasing proportions of their time in activities outside the family. Interactions with peers, neighborhood, school, and community may make substantial contributions to warmth, structure, and autonomy support. A few researchers have addressed constructs similar to warmth, structure and autonomy support provided to adolescents in contexts outside the family (Barber & Olsen, 1997; Eccles, Early, Frasier, Belansky, & McCarthy, 1997), but none have specifically incorporated the motivational model. Further research will be needed to determine

whether warmth, structure, and autonomy support provided in contexts other than the family can compensate for deficits in family environments.

Exosystem influences. This study examines the adolescent's perceptions of parenting. Parents own self-system processes and the environmental context within which parents function are not examined. The overarching goal which has guided this research, is to contribute to the information necessary to create preventive interventions aimed at reducing adolescent problem behaviors and promoting healthy development. If preventive interventions include changing parenting practices in an attempt to influence adolescent behaviors, it will be necessary to understand the environment within which parents function. Factors which need further consideration include the influence of parents' work on parent-child relationships, sources of stress (e.g., job, financial, marital), parents' perceptions of adolescent behaviors, and parents' perceptions of their own parenting practices.

Multiple perspectives. Before parenting interventions can be devised, parents' perspectives must also be understood. Research identifying and contrasting potential differences in adolescent and parent perceptions of parenting and adolescent behaviors is needed. Another area which needs exploration is the role of schools in preventing problem behaviors. Perspectives of adolescents, teachers, parents, and school officials may contribute to the understanding of ways in which adolescents' feelings of relatedness, competence, and autonomy could be increased through school activities.

Understanding the school's perspective will aid in understanding and overcoming potential barriers to providing school contexts high in warmth, structure, and autonomy support.

Summary

This chapter presented a motivational model of development based on psychological needs for relatedness, competence, and autonomy. The model provides perspective on the dimensions that have recurred throughout the parenting literature. Self-system processes were presented as the mechanisms by which an individual constructs the self and is motivated to action. The reciprocal nature of parent-adolescent interactions was discussed and it was suggested that the role of parenting is to provide an environment with ample warmth, structure, and autonomy support. The child's contribution to the parent's environment was noted. Finally, a broader view was presented. It is clear that a systems approach is necessary to appreciate the complexity of adolescent behaviors. This larger view provides the context for this study. However, only a small portion of the larger model is addressed.

Chapter 3

Dimensions of Parenting

In Chapter 2 it was suggested that a primary task for parents and others involved in the socialization of children is to create an environment in which the child's basic needs for relatedness, competence, and autonomy will be met. An environment that provides ample warmth and involvement with significant others, structure, and autonomy support will supply the child with the nutrients to meet the child's basic psychological needs. When the child is neglected or rejected by the parent, the environment is perceived as chaotic, or parents use coercive methods to obtain compliance, the child's feelings of relatedness, competence, and autonomy will be threatened. The following review provides evidence that warmth, structure, and autonomy support tend to be associated with positive developmental outcomes, while rejection, chaos, and coercion which represent extremes opposite to warmth, structure, and autonomy support are associated with less desirable adolescent outcomes.

Two approaches have been used to study parent-child and parent-adolescent relationships. One of these focuses on the contribution of the underlying dimensions of parenting to child development. The other approach has identified parent types formed by varying combinations of the underlying parenting dimensions and has explored the relationship between parent types and child development. This chapter reviews research which has addressed the relationship between the dimensions of parenting (i.e., warmth

vs. rejection, structure vs. chaos, and autonomy support vs. coercion) and adolescent outcomes. The following chapter reviews the literature which examines the relationship between parenting types and adolescent outcomes.

Warmth - Rejection

Parental warmth provides the developing child with feelings of safety and facilitates the internalization of parental values. Parents provide warmth through spending time with their child, being warm and loving, interested, and emotionally available, and by enjoying being with their child (Connell, 1990; Skinner & Wellborn, 1994). The absence of parental warmth results in neglect or even active rejection of the child. Neglect results when parents are physically or emotionally unavailable or do not enjoy being with or engaging in activities with the child. Rejection is characterized by dislike for and active rejection of the child. Warmth versus neglect or rejection has played a role in all major theories of parenting (Maccoby & Martin 1983; Barber, 1997a).

Although it was once believed that adolescents needed to distance themselves from their parents in order to establish independence, the current view is that the primary task of adolescence is to establish identity and autonomy while maintaining warm and close relationships with parents. In adolescence, as in infancy and early childhood, attachment provides a secure base from which to explore the world. Close relationships with parents provide adolescents with the support necessary for mastering the challenges associated with establishing independence (Papini & Roggman, 1992; Hill & Holmbeck, 1986). While it has been widely accepted that close relationships

with parents remain important during adolescence, it should be recognized that adolescence requires that the bond between parents and adolescents be transformed from one appropriate for childhood to one more appropriate in adolescence and adulthood.

Parental warmth has been studied under a variety of rubrics including involvement, connection, attachment, acceptance, and parental support and has been linked to a variety of positive as well as negative adolescent outcomes (Barber & Olsen, 1997; Eccles et al., 1997; Papini & Roggman, 1992; Steinberg, Elmen, & Mounts, 1989; Stice & Barrera, 1995). Individual studies have often examined multiple outcomes such as academic performance, social competence, depression, and problem behaviors.

Researchers have explored the relationship between parental warmth and a variety of academic outcomes including grades, achievement test scores, academic expectations, and academic alienation. Grade point average (GPA), both self-reported and school reported, has generally been found to have a small but statistically significant positive correlation with parental warmth, particularly when warmth has been measured using adolescent reports of parenting (Barber & Olsen, 1997; Eccles et al., 1997; Otto & Atkinson, 1997; Steinberg et al., 1989). While most studies have been cross-sectional in design and have provided only correlational information, Steinberg and associates (1989) provided longitudinal evidence for a relationship between parental warmth and GPA. Parental warmth was predictive of GPA one year later after controlling for GPA in the previous year.

In contrast to other researchers, Fuhrman and Holmbeck (1995) did not find a relationship between parental warmth and GPA. Fuhrman and Holmbeck examined the relationship between mothers' reports of maternal warmth and GPA and between a pooled measure of mothers' and adolescents' reports of family cohesion and GPA. Neither warmth nor family cohesion were significantly related to GPA. It may be that adolescents' perceptions of maternal warmth and family cohesion may be more important than mothers' perceptions in predicting adolescent outcomes.

Some measures of warmth have been related to achievement test scores while others have not. Otto and Atkinson (1997) used a variety of indicators of parental warmth (which they referred to as connection) including (1) parent-child agreement on issues such as how adolescents should spend leisure time and what constitutes appropriate roles for women, (2) frequency of school-related discussions, and (3) frequency of career-related discussions. Only parent-child agreement was associated with achievement test scores. In contrast, Steinberg and associates (1989) did not find a significant relationship between parental warmth and achievement test scores.

Parental warmth has also been associated with educational expectations (Herman et al., 1997) and with academic alienation (Eccles et al., 1997). As might be expected, parental warmth was positively associated with adolescents' educational expectations and negatively related to academic alienation as indicated by low levels of enjoyment and engagement in school, low levels of belief about the importance of academics, and school behavior problems.

Parental warmth has also been associated with other positive outcomes including psychosocial maturity, social acceptance, self-worth, and general well-being (Greenberg, Siegel, & Leitch, 1983; Papini & Roggman, 1992; Steinberg et al., 1989). Papini and Roggman (1992) not only reported positive associations between parental warmth and a variety of measures of self-competence (i.e. global self-worth, athletic competence, behavioral conduct, physical appearance, and social acceptance), but also suggest that the importance of parental warmth to positive competence is greater in periods of transition. This study suggested that attachment to parents, particularly to mothers, was of greater importance to feelings of self-competence during the seventh grade transition to junior high school than during the preceding or following years. Further evidence of the protective function of parental warmth is provided by Greenberg and associates (1983) who found that the detrimental effects of high stress on self-esteem were moderated by positive attachment to one's parents. When stress was high and parent attachment was also high, stress had little impact on self-esteem; however, when stress was high and attachment low, self-esteem was much lower.

High levels of parental warmth have consistently been associated with lower feelings of depression (Barber & Olsen, 1997; Eccles et al., 1997; Herman et al., 1997) and with lower levels of anxiety (Papini and Roggman, 1992). The negative relationship between internalizing behaviors, including depression and anxiety, and maternal warmth was significant when mothers' reports of adolescent behaviors and maternal warmth were used as well as when adolescent reports were used (Fuhrman & Holmbeck, 1995).

Weak but significant relationships have also been found between parental warmth and adolescent problem behaviors. For example, lack of closeness in parent-child interactions has been associated with the early onset of drug use (Brook, Lakoff, & Whiteman, 1980). In contrast, high levels of parental warmth appear to discourage adolescent substance use (Brook, Brook, Gordon, Whiteman, & Cohen, 1990; Brook, Gordon, Whiteman, & Cohen, 1986; Herman et al., 1997; Stice & Barrera, 1995; Turner, Irwin, Tschann, & Millstein, 1993). Low levels of parental warmth have been associated with other problem behaviors such as shoplifting, property damage, and running away from home (Barber & Olsen, 1997; Eccles et al., 1997; Herman et al., 1997).

While most of the studies examining parental warmth and problem behaviors have been correlational, Stice and Barrera (1995) provide evidence of longitudinal relations between parental support and substance use, but not between parental support and other problem behaviors. Parental support as measured by Stice and Barrera included aspects of companionship, guidance, intimacy, and affection. High levels of parental support in Year 1 predicted low levels of adolescent substance use one year later after controlling for Year 1 substance use, sex, age, and parental alcoholism. Although there was evidence for a causal relationship between parental support and substance use, Stice and Barrera did not find evidence of a causal relationship between parental support and other problem behaviors. One possible explanation for the lack of a significant relationship between Year 1 parental support and Year 2 problem behaviors may be that the behaviors represented were relatively minor infractions such

as stealing things at home, disobeying at school, and not concentrating at school. The authors suggest that while patterns of substance use are emerging among adolescents in the age group included in the study (10 to 15 years), patterns for these types of problem behaviors may have been established at a much younger age.

Despite the lack of relationship between Year 1 parental support and Year 2 problem behaviors (excluding substance use), it is interesting to note that problem behaviors at Year 1 were predictive of parental support one year later. Adolescent problem behaviors at Year 1 were negatively related to parental support one year later (Stice & Barrera, 1995). Thus, it appears that high engagement in problem behaviors may lead to withdrawal of parental support.

Although none of the studies reviewed thus far was directly aimed at parental rejection of adolescents, it is clear that high levels of warmth tend to be associated with positive outcomes, while low levels of warmth are associated with adolescent feelings of depression and problem behaviors. Two additional studies provide insight into the effects of parental neglect and rejection.

Delaney (1996) sought to identify qualitatively different parent-adolescent relationships using cluster analysis. Although her goal was to identify patterns of change in parent-adolescent relationships, findings indicated that parent-adolescent closeness among 11 to 13 year-old adolescents was relatively stable over a one-year period. Despite the unexpected stability of parent-adolescent relationships, three groups of adolescents that varied in closeness to parents and emotional autonomy were identified:

(1) Cluster 1 (Individuated) included adolescents who scored high on a measure of closeness to their parents and moderately on emotional autonomy.

(2) Cluster 2 (Connected) included adolescents who scored very high on closeness but low on emotional autonomy.

(3) Cluster 3 (Detached) included those adolescents who scored low on closeness to parents and high on emotional autonomy.

Although Delaney used the emotional autonomy scale (Steinberg & Silverberg, 1986) as a measure of adolescent individuation from parents, it has been convincingly argued elsewhere that the emotional autonomy scale actually represents a measure of emotional detachment from parents (Ryan & Lynch, 1989; Lamborn & Steinberg, 1993).

Thus, it could be argued that the clusters identified by Delaney actually represent variations in attachment to parents. Connected adolescents scored high on closeness and low on detachment; detached adolescents scored low on closeness and high on detachment; individuated adolescents scored between the connected and detached adolescents on both closeness and detachment. As might be expected, the detached group showed deficits on a variety of indicators of psychological well-being. In contrast, the connected group showed greater self-worth and lower feelings of depression and anxiety.

Further evidence of the detrimental effects of neglect and rejection is found in a study by Fauber and associates (Fauber, Forehand, Thomas, and Wierson, 1990). These researchers found that marital conflict was associated with greater rejection of

/withdrawal from the adolescent. Rejection/withdrawal was associated with both internalizing behaviors such as anxiety and depression as well as with externalizing behaviors such as taking things that belong to others and running away from home. These relationships were particularly strong among adolescents from families in which parents had been divorced within the past twelve months. However, similar, though weaker, patterns emerged among a sample of adolescents from intact families.

Structure - Chaos

The motivational model proposes that an individual's basic need for competence will be met in an environment that provides sufficient structure. Parents provide structure when they supply their child with clear expectations for behavior, when consequences are clear and consistently applied, when they help their child to identify strategies for obtaining desired outcomes, and when they provide developmentally appropriate challenges. This latter aspect of structure may be particularly important during adolescence when normative adolescent behaviors involve some risk-taking. Encouraging adolescents to engage in developmentally appropriate challenges such as sports, debate, service activities, or travel may provide important alternatives to more risky adolescent behaviors.

Although not included in discussions of structure by motivational researchers, monitoring has emerged as an important indicator of structure during adolescence. Monitoring provides the parent with the information necessary to consistently apply rules and to know when behavioral demands are being met. It seems likely that the

knowledge that parents are aware of one's activities may, in some cases, provide sufficient encouragement to conform to behavioral demands.

Chaos represents the opposite of structure and is characterized by lack of supervision, unclear or inconsistent expectations for behavior, unpredictability, and noncontingency. If the adolescent doesn't know what is expected and rules are not consistently applied, the environment is likely to be experienced as chaotic and unpredictable (Connell & Wellborn, 1991; Skinner & Wellborn, 1994).

Various aspects of structure have been studied as lax control versus firm control, behavioral control, and monitoring. The importance of structure is clearly stated by Barber (1996), "Undercontrolled environments do not foster self-regulation in children, often leaving them more impulsive, reckless, and more willing to take risks, and violate norms" (p. 3300).

The aspect of parentally provided structure that has been addressed most frequently is behavioral control, defined as monitoring and positive forms of discipline or, more frequently, as simply monitoring of the adolescent's behavior. Follow up to monitoring such as attempts to shape the child's behavior through encouragement or discipline have not been included as part of behavioral control. Instead, behavioral control has been represented by items such as "How much do your parents really know where you go at night?" and "... how you spend your money?" (Barber, 1996; Barber et al., 1994; Brown et al., 1993). Parental monitoring has been found to have a particularly strong negative influence on adolescent substance use and delinquency (Coombs & Landsverk, 1988; Loeber & Dishion, 1983), as well as having a positive relationship

with academic achievement (Barber & Olsen, 1997; Dornbusch, Ritter, Leiderman, Roberts, & Fraleigh, 1987; Herman et al., 1997; Steinberg et al., 1989). Monitoring has been negatively associated with delinquent behavior such as fighting, vandalism, theft, and running away from home (Barber, 1996), as well as with less serious externalizing behaviors such as cutting classes, using dirty language, and using alcohol (Barber et al., 1994). Barber and associates found that behavioral control as indicated by monitoring had a strong negative relationship with externalized problems and a weak, but significant, negative relationship with internalized problems (i.e., feeling lonely, confused, and depressed). For both internalized and externalized problems, high levels of perceived monitoring by parents lead to fewer problems. Using the same monitoring measure, Brown and associates (Brown et al., 1993) found monitoring to be inversely related to adolescent substance use and to have a small but significant positive relation to self-reliance as indicated by feelings of internal control and ability to make decisions without over-reliance on others.

Other researchers combined indicators of follow up and parental consistency with monitoring and achieved similar results. High levels of parental monitoring and consistent discipline were associated with low-levels of delinquency (Patterson & Stouthamer-Loeber, 1984). In a similar vein, poor parental monitoring and inconsistent discipline have been related to association with delinquent peers (Snyder, Dishion, & Patterson, 1986) and to more drug use (Brook et al., 1986). In contrast to lack of monitoring and inconsistent discipline which have been associated with higher levels of

problem behaviors, parental requirements for mature responsible behavior have been associated with lower levels of problem behavior (Brook et al., 1990).

In two studies, Stice and Barrera (1995; Stice, Barrera, & Chassin, 1993) used lack of structure or chaos in models to predict substance use and externalizing behaviors. The authors measured perceived parental control by reverse scaling items such as “Dad frequently changed the rules I was supposed to follow;” “Mom lets me get away without doing work I have been given;” and “Dad usually doesn’t find out about my misbehavior.” In their 1993 study, the authors found a curvilinear relationship between parental control and adolescent externalizing behavior and between parental control and illicit substance use. These curvilinear relationships indicated that very low and very high levels of parental control were associated with high levels of externalizing behavior and illicit substance use. A negative linear relationship was found between parental control and adolescent alcohol use. The authors suggested that extreme parental control may disrupt adolescent-parent bonding and result in rebellion against parental norms. They proposed that parents might use greater parental control regarding illicit substance use than regarding alcohol use. Thus, parental control regarding illicit substance use yielded a curvilinear relation while alcohol use resulted in less coercive, and more effective, parental control. These findings suggest that while structure is generally associated with desirable adolescent outcomes, too much structure may infringe upon adolescent’s autonomy and be perceived as coercive.

In a second analysis using the same data, Stice and Barrera (1995) looked for reciprocal relations between parental control and adolescent substance use and between

parental control and adolescent problem behaviors. Their results indicated that Year 1 perceived parental control was negatively related to Year 2 adolescent substance use, and Year 1 substance use was negatively related to perceived parental control one year later. However, the relationship for adolescent problem behaviors were not fully reciprocal. Adolescent problem behaviors at Year 1 were negatively related to parental control at Year 2, but parental control at Year 1 was not significantly related to problem behavior at Year 2. Thus, it appears that adolescent problem behaviors have a significant influence on subsequent parenting. When parents are confronted with problem behaviors they tend to reduce their efforts to control their adolescent. Although a reduction in control efforts following adolescent problem behaviors seems counterintuitive, it has been suggested by some theorists (Bell & Chapman, 1986) that increased problem behavior may increase parental tolerance for problem behavior as the behavior becomes perceived as more unmanageable. Perhaps parents feel helpless when confronted by increased adolescent problem behaviors and reduce their efforts to control their child.

Autonomy Support - Coercion

The theoretical importance of psychological autonomy has been well documented. Parental granting of psychological autonomy was identified in Schaefer's (1965) early work as an important component of healthy child development and continues to have a prominent role in theories of parenting promoted by Steinberg and colleagues (Darling & Steinberg, 1993) and by Barber (1997a). Empirically, however, few attempts have been made to measure parental support for psychological autonomy.

Instead, measures of psychological control have been reverse scored and used as indicators of parental support for autonomy. Apparently, it has been assumed that the absence of psychological control promotes psychological autonomy. Consistent with motivation researchers, it is argued here that autonomy support is provided when children are granted freedom of expression, choice, and respect. Other aspects of autonomy support include limiting the number of rules, providing rationales for rules that are necessary, and validating the child's feelings (Connell, 1990; Connell & Wellborn, 1991; Skinner & Wellborn, 1994).

Psychological control, or coercion as it has been labeled in motivation research, has been defined as "patterns of interaction that intrude upon or impede the child's individuation process" (Barber et al., 1994, p. 1121) and includes parental practices that constrain, manipulate, or attempt to control the child through psychological means such as threats, bribes, love withdrawal, and guilt induction. While it is agreed that coercive forms of discipline such as these are not autonomy supportive, it seems unlikely that their absence implies that children are respected, valued, and encouraged to freely express themselves. Thus, it appears that those studies which have focused on psychological control as an indicator of psychological autonomy have explored coercion rather than autonomy support.

Components of parental support for adolescent autonomy have been measured in a variety of ways. Turner and associates (1993), for example, used student reports of the degree to which their parents encourage independence and self-reliance versus the extent to which parents overprotect them and worry about safety. These authors found

that autonomy support was negatively related to sexual activity among sixth and seventh grade students. No relationship was found between autonomy support and fighting or between autonomy support and substance use.

Another component of autonomy support is the degree to which parents respect adolescents' opinions and desires and include them in decision making. Hence, some researchers (Brown et al., 1993; Dornbusch et al., 1985; Eccles et al., 1991) have studied the effects of adolescent-alone, parent-alone, and joint decision making on adolescent behavior. Dornbusch and associates had adolescents and parents report who made decisions about issues such as curfew, clothing, spending money, and friends. Their findings indicated that parent-alone decision making decreases and adolescent-alone decision making increases for older relative to younger adolescents. Joint decision making appears to increase for middle adolescents and decline for older adolescents. Given these findings, age of the adolescent was controlled in other analyses. The study indicated that youth-alone decision making is associated with higher levels of adolescent deviance including self-reported police contacts, arrests, running away, truancy, and smoking regularly, as well as to school recorded disciplinary actions. Thus, the authors concluded that early autonomy was detrimental for adolescents.

Brown et al. (1993) used questions similar to those used by Dornbusch (Dornbusch, et al., 1985), but designed their scale so that high scores indicated a greater proportion of joint decisions while low scores indicated a greater proportion of unilateral decisions by either parent or adolescent. Findings indicated that joint decision

making was associated with higher adolescent GPA, and lower levels of drug use and self-reliance. Although the negative relationship between joint decision making and self-reliance was unexpected, it may have been due to the operationalization of self-reliance which was used. Self-reliance was measured with a scale designed to tap the adolescent's feelings of internal control and ability to make decisions without relying on others.

Using a somewhat different procedure, Eccles et al. (1991) explored adolescent participation in family decisions. Adolescents and their parents reported how decisions were made in their family (i.e., parent tells child what to do, child usually decides, discuss it and decide together), and the frequency of adolescent input to family decisions. Data were collected at four times over the adolescent's sixth and seventh grade school years. Findings from the study indicated that adolescents experienced an increase in desire to participate in family decisions from sixth to seventh grade. Greater participation in family decision making was associated with greater intrinsic school motivation as indicated by greater interest in studying and greater liking for school. Participation in family decision making was also positively related to greater self-esteem. In contrast, adolescents who reported declining participation in family decision making over the two years had lower self-esteem and lower intrinsic school motivation.

Eccles and associates (1991) also considered the effects of too much parental control in family decisions which is likely to be interpreted as coercive by adolescents. Adolescents who perceived they had little opportunity to participate in family decisions (i.e., experienced too much parental control) had more frequent conflicts with their

parents, were much more likely to turn to their peers instead of their parents for advice and support, were more disobedient, and were more likely to forgo achievement related activities to remain popular with their peers.

In sum, the findings from Dornbusch et al. (1985), Brown et al., (1991), and Eccles et al. (1991) suggest that autonomy support, at least in the form of opportunities for decision making must be tempered with parental input. Eccles found lack of opportunity for decision making to be associated with lower self-esteem and intrinsic motivation. Dornbusch found unilateral decisions made by the adolescent to be associated with deviance. Brown and Eccles found that joint decision making was associated with positive outcomes such as higher GPA and lower substance use. Thus, it appears that autonomy must be granted in appropriate amounts within the context of parental guidance and clear boundaries.

As noted earlier, researchers have frequently attempted to examine psychological autonomy by measuring aspects of psychological control and reversing the scale (Barber et al., 1994; Barber, 1996; Barber & Olsen, 1997; Conger, Conger, & Scarmella, 1997). Psychological control has been measured most frequently using items such as "My mother wants to control whatever do," and "My mother will avoid looking at me when I have disappointed her," that focus on overcontrol of the adolescent and manipulation through guilt and love withdrawal (Barber, 1996; Barber et al., 1994) or of reports of the frequency with which their parents criticized them, made them feel guilty, threatened, cried, or whined at them to get them to comply with their wishes (Conger et al., 1997). Other studies have used observational measures of how critical the parents

were (Barber, 1996, Study 2). Regardless of the measures used, psychological control has been consistently predictive of internalized symptoms such as depression and anxiety and in some cases externalized symptoms such as delinquency and substance use (Barber, 1996, Study 3; Brook et al., 1986; Brook et al., 1990; Conger et al., 1997). In addition, to being related to internalized and externalized symptoms, Conger and associates also found that psychological control undermined adolescent self-confidence.

Several other studies in which psychological control was used in lieu of a measure of autonomy support have been conducted. These studies are discussed in the next section which considers those studies that have examined three dimensions of parenting simultaneously.

Thus far, this chapter has reviewed the simple relationships between parenting dimensions and a variety of adolescent outcomes. In general, parental warmth tends to be positively associated with outcomes such as academic performance, psychosocial maturity, social acceptance, self-worth, and self-competence. Lack of parental warmth tends to be associated with depression, anxiety, and adolescent problem behaviors such as substance use, fighting, and other delinquent activities. Poor parental monitoring and inconsistent discipline, both of which are aspects of chaos or lack of structure, have been linked to association with delinquent peers and to problem behaviors. Autonomy support in the form of joint decision making by adolescents and parents has been associated with higher self-esteem and GPA, less drug use, and greater liking for and motivation in school. In contrast, psychological control (or coercion) has been

associated with lower self-confidence, anxiety, and in some cases substance use and delinquency.

Warmth, Structure, and Autonomy Support

A few studies have been directed at identifying the joint effects of multiple dimensions of parenting on adolescent outcomes. These studies employed constructs analogous to warmth, structure, and autonomy support or their opposites, rejection, chaos, and coercion. Two of the studies examined the effects of parenting over a one-year period (Herman et al., 1997; and Steinberg et al., 1989). Barber and Olsen (1997) and Eccles and associates (1997) expanded the scope by including measures of connection (warmth), regulation (which contains aspects of structure), and psychological autonomy that were provided through experiences with peers, school, and neighbors, as well as in the family.

Measures of warmth and psychological autonomy were fairly similar across the studies. Items measuring parental expressions of closeness and acceptance were used as indicators of warmth. Parental rejection was measured using items such as “acts as though I’m in the way” and “often seems glad to get away from me.” Psychological autonomy was generally measured by reversing the scores on measures of psychological control. Thus, what is referred to here as support for psychological autonomy (or autonomy support) might be thought of as absence of coercion. While similar operationalizations of warmth and autonomy support were used across the studies, a variety of constructs were used to measure components of structure. Barber and Olsen (1997) and Eccles and associates (1997) used measures of monitoring (i.e., parents’

knowledge of where the adolescent is, who he/she is with, etc.). Others combined measures of monitoring with measures of decision making patterns (adolescent vs. parent), household organization (family members knowledge of where other family members are and when they will be home, etc.), and lax control (e.g., failure to enforce rules or to follow through on discipline). Adolescent outcome measures tended to focus on three general areas, academic performance, internalizing symptoms such as depression and anxiety, and problem behaviors.

Although most researchers found that warmth, structure, and autonomy support had independent effects on all three categories of outcome variables, their contributions varied when parenting dimensions were examined simultaneously. When multiple parenting dimensions were included in regression models, warmth tended to be predictive of academic performance in some studies (Herman et al., 1997; Steinberg et al., 1989), but not in others (Barber & Olsen, 1997; Eccles et al., 1997). Structure tended to have a strong negative association with substance use and delinquent activities and a weak, but significant, positive association with academic performance (Eccles et al., 1997; Herman et al., 1997; Steinberg et al., 1989). Lack of autonomy support tended to have effects on all three outcome areas (Barber & Olsen, 1997; Eccles et al., 1997; Herman et al., 1997; Steinberg et al., 1989).

It should be noted that parental warmth showed few substantial relationships when examined in models including other parenting dimensions. Herman and associates (1997) found warmth to be predictive only of academic outcomes. Other researchers found warmth to negatively predict feelings of depression and anxiety,

particularly for girls (Barber & Olsen, 1997; Eccles et al., 1997). Eccles and associates also found warmth to be related to problem behaviors, but only for girls. These weak effects reflect the strong relationship between warmth and the indicators of structure and autonomy support. Correlations between warmth and other parenting dimensions ranged from .30 to .60. In contrast, estimates of the correlations between structure and autonomy support (or absence of coercion) ranged from approximately .10 to .25.

Structure, or more specifically monitoring, was the parenting dimension most strongly associated with adolescent problem behaviors (Eccles et al., 1997; Herman et al., 1997). Despite the importance of structure in other studies, Barber and Olsen (1997) found that low levels of structure were predictive of problem behaviors only for girls. The lack of predictive power for structure in Barber and Olsen's work reflects the presence of other settings – peer, school, and neighborhood – in their model. Peer regulation was much more important than family regulation (structure) in predicting problem behaviors for both boys and girls. Parenting practices, however, have been shown to be particularly important in peer selection (Brown et al., 1993).

Although significant interactions between parenting dimensions and gender were not reported in the literature reviewed here, Barber and Olsen (1997) and Eccles et al. (1997) analyzed the effects of parenting on adolescent outcomes separately for girls and boys. Their results indicated potential differences between boys and girls on a variety of measures and may be indicative of gender interactions with parenting dimensions. Eccles et al. found warmth to be predictive of depression for girls, but not for boys, and monitoring (included as structure in this review) to be predictive of academic

performance for girls, but not for boys. Barber and Olsen found monitoring predictive of fewer problem behaviors for girls, but not for boys. In addition, Barber and Olsen found autonomy support to be predictive of feelings of depression for boys, but not for girls, and to problem behaviors for girls, but not for boys. These differences in findings for girls versus boys, are consistent with a recent study conducted by Werner and Silbereisen (2003) which concluded that while contact with deviant peers was directly associated with adolescent problem behaviors, the influence of parenting practices were indirect and varied as a function of gender. Taken together these findings indicate the need for further research addressing potential interaction effects among parenting dimensions and gender as well as the combined influence of peers and parents on adolescent outcomes.

While other researchers measured positive dimensions of parenting, Fauber and associates (1990) focused on rejection, lax control (chaos), and psychological control (coercion). In contrast to other studies in which monitoring and inconsistent discipline have been found to be important predictors of delinquency and externalizing behavior, Fauber and associates (1990) found that lax control, defined as the degree to which the parent failed to monitor and regulate adolescent activities and conduct, did not have a strong association with adolescent problem behaviors. Parental rejection, however, was strongly associated with problem behaviors and to a lesser extent with internalizing symptoms. Consistent with other researchers, Fauber found that parental use of psychological control was the most important predictor of adolescent internalizing symptoms.

Summary

The studies reviewed here have shown that all of the dimensions of parenting are related to adolescent outcomes. Further, although the dimensions of parenting tended to be intercorrelated, all of the dimensions made unique contributions to at least some of the adolescent outcomes. When considered at the bivariate level, parental warmth tended to have a relationship with most adolescent outcomes, but when included in models with other parenting dimensions, warmth made a unique positive contribution only to academic performance, a unique negative contribution only to adolescent internalizing symptoms, and a unique contribution to problem behaviors in one study and only for girls. Parental rejection had a strong relationship with internalizing symptoms and an even stronger relationship with adolescent problem behaviors. Parental provision of structure, measured primarily as monitoring, was especially important in preventing problem behaviors. Psychological autonomy, or absence of coercion, tended to be positively associated with academic performance and negatively associated with internalizing symptoms and problem behaviors. Psychological control or coercion was a strong predictor of internalizing problems such as depression and anxiety.

Chapter 4

Parenting Typologies

An alternative to examining the dimensions of parenting has been to examine the parenting typologies that result from varying combinations of the dimensions. The most well known of these typologies grew out of a qualitative classification scheme based on the work of Baumrind (1971, 1987, 1991).

Baumrind's Typology

In her early work, Baumrind (1971) qualitatively identified three parenting types; authoritarian, authoritative, and permissive. According to Baumrind (1991), these parental types vary in their responsiveness and demandingness toward their children. Responsiveness refers to the extent to which parents encourage individuality and self-regulation through being attuned, supportive, and sensitive to the needs and demands of their child. Responsiveness incorporates the notion of contingency of parental response to the prior behavior of the child. Demandingness refers to the demands which parents make upon their children to become integrated into the family and includes supervision, discipline, and parental expectations that the child behave in an appropriately mature manner. When considered within the framework presented above, responsiveness appears to incorporate aspects of warmth, regulation, and psychological autonomy, while demandingness refers primarily to regulation of behavior.

Authoritative parents are both responsive and demanding. They are loving, committed and encourage their children's independence through emotional support and clear expectations for behavior. They contribute to their children's cognitive development through providing a stimulating and challenging environment. Rules in authoritative families are clearly stated and the reasons for rules discussed. Discipline used by authoritative parents tends to be supportive rather than punitive. Parents in these families maintain a balance between granting children autonomy and exerting parental control. They recognize that younger children need more parental control while adolescents need relatively more autonomy. Authoritative parents encourage bidirectional communication and respect the child's viewpoint. Clearly, the authoritative parenting style includes high levels of warmth, structure, and autonomy support.

Like authoritative parents, authoritarian parents demand conformity from their children, but they are not particularly responsive. They focus on controlling their children's behavior and attitudes and emphasize obedience, respect for authority, and order at the expense of autonomy. In general, authoritarian parents expect rules to be followed without further explanation.

Permissive parents in Baumrind's original scheme were parents who adopted an accepting attitude toward their children, used little punishment, and avoided exerting parental control. They included both parents who were warm in their interactions with their children as well as those who tended to be cold and unresponsive (Baumrind, 1971; Maccoby & Martin, 1983).

Maccoby and Martin (1983) extended Baumrind's threefold typology by categorizing families according to the two dimensions of responsiveness and demandingness. The two dimensions resulted in four parenting categories; two corresponding to Baumrind's authoritative and authoritarian types, and two which further divided Baumrind's permissive category into indulgent and neglectful. Authoritative parents were high on both responsiveness and demandingness; authoritarian parents were low on responsiveness and high on demandingness. Indulgent parents were characterized by high levels of responsiveness and low demandingness. These parents were warm and accepting, but made few demands for maturity and rarely exercised parental authority. Neglectful parents were similar to indulgent parents in that they placed few demands upon their children, but, unlike indulgent parents, they were relatively uninvolved in their children's lives and failed to monitor their children's activities.

Empirical Findings

A substantial number of studies have examined the effects of Baumrind's parenting types on adolescent development. Parenting styles have been measured and classified using a variety of methodologies. Some researchers have used two dimensions (acceptance/involvement and strictness/supervision which correspond to Maccoby and Martin's (1983) dimensions of responsiveness and demandingness) to classify parents into four parenting styles--authoritative, authoritarian, indulgent, and neglectful (Glasgow et al., 1997; Lamborn, Mounts, Steinberg, & Dornbusch, 1991; Steinberg, Lamborn, Darling, Mounts, & Dornbusch, 1994). Alternatively, the product

of a family's scores on the acceptance/involvement scale and the strictness/supervision scale has been used as a measure of overall authoritativeness (Mounts & Steinberg, 1995).

In other studies, three parenting dimensions have been used to classify parents as authoritative versus nonauthoritative. Parents rated above the median on acceptance/involvement, firm control (monitoring and limit setting), and psychological autonomy were classified as authoritative (Steinberg, Lamborn, Dornbusch, & Darling, 1992; Steinberg, Mounts, Lamborn, & Dornbusch, 1991). Those with rating below the median on any of the three dimensions were classified as nonauthoritative (Steinberg et al., 1991) or assigned an authoritativeness score (0-3) based on scores from the three dimensions (Steinberg et al., 1992).

Another strategy for classifying parents has been to use scales specifically developed to measure authoritative, authoritarian, and permissive styles (Dornbusch et al., 1987; Smetana, 1995). These scales tended to combine parenting dimensions into a single index. For example, the authoritative index contained items that addressed structure (parents encourage youth to look at both sides of issues) and autonomy (parents admit that youth sometimes knows more than they).

Regardless of the method used to measure parenting style, authoritative parenting has been found to promote positive adolescent outcomes. Authoritatively-reared adolescents have been shown to score higher than nonauthoritatively-reared youth on measures of academic competence, self-perceptions of academic ability, and self-reliance and to score lower on measures of adolescent internal distress and problem

behaviors (Baumrind, 1991; Dornbusch et al., 1987; Lamborn et al., 1991; Steinberg et al., 1991, 1992, 1994). Authoritative parenting tends to enhance the effects of parental warmth in school related activities on adolescent school performance. Thus, researchers have concluded that parental warmth in school is more likely to promote adolescent academic success when it occurs within an authoritative home environment (Paulson, 1994; Steinberg et al., 1992). Further, while authoritative parenting tends to occur more frequently among white middle-class families, the beneficial effects of authoritative parenting appear to transcend gender, ethnicity, family structure (single parent vs. two parents), age, and social class (Dornbusch et al., 1987; Glasgow, 1997; Steinberg et al., 1991). In comparing authoritative parenting with other parenting styles, Glasgow stated, “authoritative parenting is the most successful in fostering personal and social responsibility in adolescents, without limiting their emerging autonomy and individuality” (Glasgow et al., 1997, p. 521).

In addition to having direct effects on adolescent outcomes, authoritative parenting appears to alter the influence of peers on adolescents. Mounts and Steinberg (1995) used longitudinal data to determine whether authoritativeness moderated the relationship between adolescents’ behavior and the behavior of their friends. Authoritative parenting appeared to enhance the positive effects of high achieving peers and buffer the effects of substance-using peers. For adolescents with medium and high authoritative parents, having friends with high GPA’s predicted improvement in grades one year later. In contrast, among students with low authoritative parents, having friends with high GPA’s had no effect on grades one year later. Not only did

authoritative parenting enhance the effect of positive peers, but authoritative parenting also buffered against the negative effects of drug-using peers. For adolescents with low and medium authoritative parents, having friends with higher drug use lead to greater drug use one year later. For adolescents with high authoritative parents, having friends with higher drug use had no effect on their own substance use one year later.

Adolescents with nonauthoritative parents face additional disadvantages in the area of self-perceptions. Glasgow and associates (1997) found that adolescents with nonauthoritative parents were more likely to attribute their school successes to external causes such as luck and incidences of poor performance to lack of ability. Further, students who made higher proportions of these dysfunctional attributions had lower levels of classroom engagement and spent less time on homework one year later.

While the benefits of authoritative parenting were consistent regardless of the method used to classify parents, the effects for authoritarian parenting were not so consistent. Lamborn (Lamborn et al., 1991) and Steinberg (Steinberg et al., 1994) found that adolescents reared in authoritarian homes were similar to those reared in authoritative homes on measures of academic performance, substance use, and delinquency. In contrast, Dornbusch et al. (1987) found authoritarian parenting to be negatively associated with academic performance. A possible explanation for this apparent discrepancy lies in the indicators of authoritarian parenting. The Lamborn and Steinberg groups classified parents along two dimensions, acceptance/involvement and strictness/supervision. Essentially, authoritarian parenting referred to those parents who were high on monitoring and limit setting (strictness/supervision) and low on

acceptance/involvement. In the Dornbusch study, the authoritarian index included items which measured parenting practices such as telling youth not to argue with adults, insisting that parents are correct and should not be questioned, and using punishment or threats to encourage the adolescent to improve grades. These items indicate the use of coercion or psychological control in obtaining conformity. Thus, it appears that authoritarian parenting featuring monitoring and limit setting, as in the Lamborn and Steinberg studies, is positively associated with academic performance, while authoritarian parenting that focuses on coercive punishment is negatively associated with academic performance.

Although adolescents from authoritarian homes fared as well as youths from authoritative homes in terms of academic performance and low levels of substance use and delinquency, youths from authoritarian homes had poorer self-perceptions than other youth. Both self-perceptions of social competence and of academic competence were lower than for youth with authoritative or indulgent parents and tended to be similar to those of youth raised by neglectful parents (Lamborn et al., 1991; Steinberg et al., 1994). It appears that authoritarian parents achieve low levels of problem behaviors from their adolescents at the expense of their self-confidence.

Adolescents with indulgent parents did not differ from those with authoritative parents on measures of self-reliance, social competence, and delinquency. Although adolescents from indulgent homes tended to have somewhat lower grades than those from both authoritative and authoritarian homes, youth from indulgent homes had higher perceptions of their academic competence than did authoritarian reared youth

(Lamborn et al., 1991; Steinberg et al., 1994). Thus, it appears that indulgent parenting fosters social competence, at the cost of greater levels of school misconduct and drug use (but not other delinquent activities).

Adolescents from neglectful families reported the poorest outcomes.

Adolescents from neglectful homes scored worse than those from authoritative homes on all indicators of psychosocial development, academic competence, psychological symptoms, and problem behaviors. Youth from neglectful families scored as poorly as those from authoritarian families on social competence and as poorly as those from indulgent families on drug use and school misconduct (Lamborn et al., 1991; Steinberg et al., 1994).

These findings suggest that parenting styles tend to be ordered in terms of effectiveness, with authoritative the most effective and neglectful the least effective. Depending on the relative value parents place on academic performance and low drug use relative to social competence, authoritarian and indulgent parenting may exchange positions. Further, examination of parenting styles over time suggests that the benefits of authoritative parenting are maintained while the deleterious effects of neglectful parenting continue to accumulate over time (Steinberg et al., 1994).

The studies reviewed thus far have relied on adolescents' reports of their parents' behaviors as indicators of parenting type. Smetana (1995) provided insight into parental perceptions of parenting. Parents were classified as authoritative, authoritarian, or permissive based on their own responses to questions about parental authority (e.g., "I have always encouraged give-and-take whenever my child felt that family rules and

restrictions were unreasonable,” “I have always felt that what children need is to be free to make up their own minds and to do what they want to do, even if this does not agree with what I might want”). In addition, parents rated 24 hypothetical transgressions (or adolescent acts) for legitimacy of parental authority (whether it was OK or not for parents to make a rule about a particular act), the areas of the transgression (whether an issue of morality, a conventional issue, personal issue, or safety issue was involved), parents obligation to make a rule regarding the issue, contingency of the act on parental authority (i.e., whether the act is always wrong or wrong because the parent said so), and justifications for exercising parental authority. A moral issue was defined as one that has an impact on others and included items such as taking money without permission, lying, and breaking a promise to parents. Conventional issues were those that generally contribute to social order or politeness and included transgressions such as not doing household chores, eating with elbows on the table, and cursing. Friendship transgressions included activities such as seeing a friend whom parents didn’t like and having friends over when parents were away. Personal issues referred to activities such as choosing clothes and use of spending money. Health and safety issues included activities such as riding with new drivers, smoking cigarettes, and eating junk foods.

Smetana (1995) found that parents’ judgments about the legitimacy of parental authority varied with parenting styles. Differences were primarily over the boundaries of adolescents’ personal jurisdiction. Only authoritative parents had clear boundaries between moral, conventional, and personal issues. Authoritative parents granted their adolescents autonomy over personal issues, but had clear rules in other areas.

Authoritative parents treated transgressions in moral areas as more wrong than did permissive parents. They also discussed rules more frequently with sixth graders, but did not differ from other parents in discussions with eighth and tenth graders.

Permissive parents gave adolescents more latitude with regard to what constitutes personal issues by considering some conventional issues as personal. Permissive parents were less likely to treat moral events as moral, and reasoned about friendship issues in moral terms. Despite their leniency in other areas, permissive parents were not more permissive with regard to issues that involved health or safety (Smetana, 1995).

Authoritarian parents did not differentiate between moral and conventional issues, and were more likely to moralize conventional issues. They were also more likely than other parents to believe they had an obligation to make rules regarding personal and friendship issues. These findings suggest that not only do parenting behaviors vary with parenting type, but that parents differ by parenting type in attitudes toward a variety of adolescent behaviors. Apparently, authoritative parents were more likely to define moral, conventional, friendship, personal, and safety issues in a manner consistent with the researcher. Permissive parents were more likely to define friendship issues as within the moral domain, and authoritarian parents believed that conventional issues were within the moral domain. When parents believed a particular transgression involved moral issues (using their own definitions), the transgression was viewed as more serious and, therefore, obliged to parental authority.

Although distinct differences have been identified among the parenting types based on the original Baumrind (1971) and Maccoby and Martin (1983) typologies, it should be noted that many parents could not be classified into a single category (Glasgow et al., 1997; Lamborn et al., 1991; Smetana, 1995; Steinberg et al., 1994). In her more recent work, Baumrind (1991) has expanded the typology to include seven family types based on variations in parental authority—*directive/conventional control*, *assertive control*, *supportive control*, and *intrusive control*. The third wave of a longitudinal study of children and their parents was used to expand the previous parent typology to accommodate variations associated with adolescence.

Directive/conventional control was measured with observer ratings of parental use of restrictive control and belief in conventional values. Assertive control was measured using observer ratings of parental firm, but nonrestrictive, monitoring of adolescents' activities and enforcement of rules and might be thought of as containing some of the aspects of provision of structure as defined within the motivational framework.

Supportive control contained items that assessed parental use of responsive discipline, rational explanations, intellectual stimulation, and encouragement of independence.

Thus, supportive control contained aspects of both structure and autonomy support. A fourth scale, measuring intrusiveness contained items assessing parental officiousness and subversion of the child's independence and seems comparable to a measure of parental coercion. The seven categories and associated adolescent outcomes were as follows:

1. Parents in **authoritative** families were high on both assertive and supportive control. Adolescents in these families were highly competent (i.e., self-regulated, prosocial, and socially responsible), perceived their parents to be loving and influential, and had high levels of self-esteem and internal control beliefs. In terms of the motivational model, authoritative parents appear to be high on warmth, structure, and autonomy support.

2. **Democratic** families were comprised of a subset of what would have been considered permissive under the previous typology. Parents in these families were highly supportive and caring, but were only moderately demanding as indicated by moderate scores on assertive control. Democratic parents appear to be high on warmth and autonomy support, and moderate on structure. Adolescents in these families, like those in authoritative families, were highly competent, had high self-esteem and internal control beliefs, and saw their parents as loving and influential. However, youth from democratic families tended to be more likely than those from authoritative families to have experimented with alcohol and drugs.

3. Parents in **directive** families were high on conformity at the expense of adolescent autonomy. Parents in these families tended to value adolescent obedience over individuality. They provided clear rules and closely monitored adolescent activities. This category was further subdivided into:

a. **Nonauthoritarian directive** families included parents who were highly demanding of conformity but were not intrusive. Adolescents with nonauthoritarian directive parents perceived their parents as loving and influential, but

also as restrictive. Thus, these parents might be seen as high on warmth and structure and low on coercion. Adolescents in these families tended to be less self-regulating, prosocial, and socially responsible than those from authoritative and democratic families. Adolescents in nonauthoritarian directive families also showed a greater tendency to seek adult approval, had negative attitudes toward drugs, and an external locus of control. These adolescents also had the lowest level of alcohol and drug use.

b. **Authoritarian directive** families used forms of parental control that intrude upon adolescents' independence. Adolescents from authoritarian directive families saw their parents as restrictive and were less likely than adolescents in nonauthoritarian directive families to perceive their parents as loving. Thus, this group might be seen as low to medium on warmth and high on structure and coercion. These adolescents scored high on negative attitude toward drugs, external locus of control, and were more likely than adolescents from authoritative, democratic, and nonauthoritarian directive families to have internalizing problems.

4. **Good enough** families tended to have mid-range scores on the measures of directive/conventional, assertive, and supportive control. Parents in these families were perceived as more loving than those in authoritarian directive families, but generally not as loving as authoritative and democratic parents were perceived by their adolescents. Adolescents in these homes were more likely to use illicit drugs than were those from authoritative and authoritarian directive homes, but were no more likely to use drugs than were adolescents from democratic homes. Girls from these homes tended to feel somewhat alienated and had low levels of self-esteem.

5. **Nondirective** families tended to be nonrestrictive (low scores on directive/conventional control) and had moderate to high scores on supportive control. Nondirective parents granted their adolescents substantial autonomy and tended to avoid confrontation. Adolescents in these homes perceived their parents as not particularly loving nor restrictive. They might be described as low to moderate on warmth and structure, but moderately high on autonomy support. Adolescents from these homes were least likely to have a negative attitude toward drugs and among the most likely to use alcohol and drugs.

6. **Unengaged** families were low on assertive and supportive control. In the previous typology, these families would have been categorized as neglectful. Adolescents in these families were least likely to perceive their parents as loving and had the lowest scores on self-regulated, prosocial, and socially responsible behaviors. These adolescents exhibited more problem behaviors than other youth and, along with adolescents from nondirective families, were more likely to use alcohol and drugs.

Summary

The effectiveness of authoritative parenting has been well-documented. Authoritatively-reared youth tend to be academically and socially competent, exhibit little internal distress, and engage in relatively few problem behaviors. Authoritative parenting tends to enhance the effects of parental school involvement and the influence of prosocial peers, while buffering the influence of deviant peers.

Adolescents with nonauthoritative parents face disadvantages on several fronts. They tend to make dysfunctional attributions, attributing their academic successes to

external causes and their failures to internal causes. Adolescents from authoritarian homes tend to have low perceptions of their own academic and social competence. Adolescents from indulgent homes are socially competent, but more likely to engage in problem behaviors. Youth from neglectful homes tend to be disadvantaged on all measures and their deficits tend to accumulate over time.

More recent Baumrind work incorporated three additional parenting types that emerge during parenting of adolescents and appear to be more closely associated with variations in parental provision of structure and autonomy support as well as to varying levels of warmth. It should be noted, however, that the references to warmth, structure, and autonomy support reflect broad generalities with only a few of the aspects of these constructs actually included in the original measures.

Chapter 5

The Current Study

The primary goal of the this study is to gain a better understanding of adolescent problem behaviors within the context of healthy adolescent development. Toward that end, three areas of research have been reviewed and a motivational model of development has been used as a framework for integrating that research. The review of literature included a brief summary of research identifying risk and protective factors associated with adolescent engagement in problem behaviors, and more extensive reviews of the research examining parenting dimensions and adolescent outcomes, and parenting typologies and adolescent outcomes. This chapter expands on the rationale for review of each of these areas of research, discusses the implications of viewing adolescent problem behaviors within the framework of Connell's (1990) motivational model of development, and provides the methodology for the current study.

Risk and Protective Approach to Problem Behaviors

In Chapter 1, problem behaviors were broadly defined as behaviors that have the potential to create immediate as well as future problems for adolescents (Allen, Aber, & Leadbetter, 1990). This definition incorporates risk-taking behaviors such as driving too fast, playing car chase games, and engaging in unprotected sexual intercourse, as well as serious illegal behaviors such as theft and vandalism. The

study of adolescent problem behaviors has tended to focus on substance use and delinquent offenses. Use of alcohol and marijuana has generally been seen as a gateway to more serious problem behaviors, and the goal of research has been to identify factors that are associated with engagement in problem behaviors so that they might be reduced.

Desire to reduce adolescent problem behaviors led researchers to undertake the identification of risk and protective factors. Within this framework, risk factors for problem behaviors have been defined as those conditions or actions that increase the likelihood that an adolescent will experience poor outcomes such as delinquency or drug addiction. Protective factors have been defined as conditions or actions that tend to insulate the adolescent from the deleterious effects of risk factors. While the risk and protective factor approach has advanced our understanding of problem behaviors and has led to the development of interventions designed to reduce adolescent problem behaviors, the approach has been relatively simplistic. Any variables that have been positively associated with problem behaviors have been called risk factors, while variables that are negatively associated with problem behaviors have been proposed as protective factors. Thus, lack of family bonding has been identified as a risk factor for problem behaviors, while strong family ties has been proposed as a protective factor. Few studies have directly addressed whether the presence of protective factors actually ameliorates or moderates the deleterious effects of risk factors. The strength of the risk and protective approach is that it takes into consideration a wide variety of environmental variables such as neighborhood characteristics, family context, and

individual factors such as commitment to school and association with positive role models.

The Role of Parenting and the Motivational Model

Substantial evidence points to parenting styles as important influences on adolescent problem behaviors. Lack of parent-child closeness has been associated with drug use (Brook et al., 1980) and fighting (Turner et al., 1993). Unclear expectations for behavior, poor monitoring of behavior, and inconsistent punishment have been associated with drug use and delinquent activities (Hawkins et al., 1992; Patterson et al., 1984). The association of parenting styles with adolescent problem behaviors led to the broader review of parenting and adolescent outcomes presented earlier. This review indicated that parenting was not only an important influence on problem behaviors, but on adolescent outcomes such as academic performance, self-competence, ego development, and self-esteem that have been associated with engagement in problem behaviors.

A motivational model of development (Connell, 1990) was presented to provide a framework for examining adolescent behaviors and the parenting styles that influence these behaviors. The motivational model posits that individuals have basic psychological needs for relatedness, competence, and autonomy. Individuals continuously appraise their feelings of relatedness, competence, and autonomy to determine how well their basic psychological needs are being met. Fulfillment of these needs leads to engaged, concentrated effort which may result in social, academic, and personal development. When one of the basic psychological needs is challenged or

insufficiently fulfilled, the individual seeks experiences to fulfill that need. When adolescent problem behaviors are considered within this framework, it seems likely that engagement in some forms of risk-taking problem behaviors may contribute toward feelings of relatedness, competence, and autonomy. For example, social use of alcohol may contribute to feelings of relatedness through the camaraderie the adolescent feels when engaging in a forbidden activity with friends. Adolescents may feel autonomous when exerting their independence by engaging in behaviors that are disapproved by parents and other adults.

According to the motivational model, individuals are able to satisfy their needs for relatedness, competence, and autonomy when their social context provides ample amounts of warmth, structure, and autonomy support (Connell, 1990; Connell & Wellborn, 1991; Skinner & Wellborn, 1994). From the adolescent's perspective, warmth is provided through warm, nurturing relationships in which the adolescent can feel loved, safe, and secure. Structure is provided when expectations for behavior are clear, rules are consistently applied, and information about how to achieve desired outcomes is available. Autonomy support is provided when adolescents are granted freedom of expression, choice, and respect. Parents, teachers, peers, schools, and neighborhoods contribute to the adolescent's social context. While parents are primary contributors to the social context for young children, peers, school, neighborhood, and the larger community provide warmth, structure, and autonomy support as the child moves through adolescence. Despite the increasing importance of peers and others during adolescence, parents continue to have substantial influence on

adolescent attitudes and behaviors (Brown, Mounts, Lamborn & Steinberg, 1993).

During adolescence, parents are expected to continue to supply love and emotional support while providing an environment in which the adolescent can exercise greater independence and freedom of choice. Parents may also provide structure through monitoring the adolescent's activities, providing advice and strategies for obtaining desired outcomes, and through encouraging engagement in physically and intellectually challenging activities.

A review of parenting literature revealed three recurring themes that tended to correspond with the motivational model's parental dimensions of warmth, structure, and autonomy support. Since studies of parenting and adolescent behaviors have used a wide variety of measures to represent dimensions of parenting, substantial liberty was taken in classifying measures as representing warmth, structure, and autonomy support. In many cases, a single aspect or rough approximation of the construct of interest was examined. Structure was frequently measured using items addressing parental monitoring, while ignoring contingent responsiveness and strategies for solving problems. Autonomy support was frequently represented as absence of coercion (psychological control) with few efforts to include measures of trust, respect, or encouragement of independence. Despite these shortcomings, patterns emerged suggesting that specific parenting dimensions are linked to particular adolescent outcomes. Further, a review of parenting types suggests that varying combinations of warmth, structure, and autonomy support are associated with different adolescent behavior patterns.

A New Perspective on Adolescent Problem Behaviors

Viewing problem behaviors through the lens of the motivational model suggests that we need to consider the role that problem behaviors may play in adolescent development rather than simply focusing on their elimination. This view is consistent with that of researchers such as Baumrind (1987; 1991) and Barber (1997a) who have argued that it is possible that risk-taking behaviors such as experimenting with drugs are functional in adolescent development. They have proposed that engagement in some risk-taking may help adolescents gain recognition from peers and establish independence from their parents. If, as suggested by Baumrind (1987) and Barber (1997a), engaging in some risk-taking behaviors is a functional part of adolescent development, then one would not expect low levels of engagement in problem behaviors to, necessarily, undermine healthy adolescent development.

Baumrind (1991) argued that experimentation with alcohol and drugs falls under the category of exploratory risk-taking and provided some evidence that exploratory drug use does not necessarily undermine development. Baumrind examined five categories of adolescent substance users ranging from nonusers through dependent users. Results indicated that alcohol users and experimental users of marijuana were as cognitively competent, as measured by achievement test scores, as nonusers. In contrast, heavy and dependent users lacked cognitive competence and achievement motivation. Dependent users were also more likely to engage in other problem behaviors. These findings suggest that there may be some threshold level of substance use or experimentation, and that experimentation at levels below that

threshold may not seriously interfere with adolescent functioning. If this is the case, it is important to understand why some youth experiment with alcohol and marijuana but do not become regular users. Following this reasoning, the relationship between parenting practices and adolescent substance use will be explored.

The motivational model may also have implications for the risk and protective factor approach to studying problem behaviors. It was noted earlier that researchers have not identified the potential mechanisms through which protective factors operate. It is proposed here that protective factors are protective to the extent that they promote adolescent feelings of relatedness, competence, and autonomy. Hawkins and associates (1992) and Hirschi (1969) have proposed that parental involvement and family bonding operate as potential protective factors against delinquent behaviors. The inclusion of a measure of parental warmth in the current study permits examination of the relationship between parental warmth, risk factors, and adolescent problem behaviors. The research explores whether warmth moderates the relationship between risk factors and adolescent problem behaviors. Similarly, there appears to be evidence that poor family management is a risk factor for problem behaviors and that clear rules and consistent discipline (components of structure) are associated with less substance use. This study also explores whether structure serves as a protective factor, moderating the relationship between risk factors and adolescent problem behaviors. The relationship between autonomy support (allowing adolescents to make their own choices within clear boundaries) and risk factors is also explored.

When parenting is viewed within the framework of the motivational model, it appears that parents, whether consciously or not, may influence adolescent outcomes when they emphasize some dimensions of parenting over others. The review of parenting literature leads to speculation that authoritarian parenting, with its emphasis on structure and control through the use of coercion, may lead to less substance use among adolescents, but may also inhibit social competence. Democratic and permissive parenting which have greater emphasis on autonomy support and less focus on control through the use of coercion may promote social competence, but also increase the likelihood of substance use. Through examining the relationships among parenting dimensions and adolescent outcomes, this project seeks to increase our understanding of the tradeoffs that parents may make in adopting one parenting style over another.

Study Overview

This study explores the relationships among parenting dimensions and adolescent outcomes within the framework of the motivational model using newly developed measures of parenting. Previous research often failed to make clear distinctions among parenting dimensions, especially between autonomy support and coercion. This study seeks to clarify the distinctions between parental use of psychological control or coercion and support for autonomy. Thus, a portion of this project is devoted to analyzing the measurement of dimensions of parenting.

Specifically, this study seeks to (a) extend the current understanding and measurement of parenting dimensions and their links to adolescent competence and

problem behaviors, (b) examine the effects of alcohol and marijuana use on overall adolescent competence and to consider the implications of those effects for parenting, and (c) determine whether parental provision of warmth, structure, and autonomy support ameliorates the effects of risk factors, such as having friends who use drugs, which tend to increase adolescents' likelihood of engaging in substance use and other problem behaviors. The research questions addressed in each of these areas are provided below in italics.

Parenting Dimensions

Are there six distinct parenting dimensions (i.e., warmth, rejection, structure, chaos, autonomy support, and coercion) or are there three bipolar dimensions (warmth vs. rejection, structure vs. chaos, and autonomy support vs. coercion)? (Q1)

Consistent with the motivational model, adolescents' perceptions of their parents' warmth, structure, autonomy support and their opposites, rejection, chaos, and coercion, are measured (see Chapter 2 for descriptions of each of these dimensions). In previous research these, or similar, constructs have been treated as opposite anchors of continuous dimensions (e.g., warmth vs. rejection). One of the goals of this study is to determine whether parenting practices are better represented by three dimensions or six dimensions.

How are parenting dimensions related to adolescent outcomes? (Q2)

The selection of outcome measures for use in this study was guided by a belief that adolescent problem behaviors should be addressed by promoting successful adolescent development. A shift in focus from treating or preventing problem

behaviors to promoting successful development is needed. In keeping with this belief, the study includes a variety of desirable adolescent outcomes as well as measures of substance use and other problem behaviors. Since parenting dimensions have been related to cognitive, social, emotional, and behavioral outcomes, measures from each of these are included. Self-reported grades and academic competence address the cognitive domain; social competence is included as a measure of social functioning; and global self-worth and perceptions of personal control (mastery) address the emotional domain. Behavioral outcome measures include substance use and problem behaviors.

Warmth and rejection. Based on the review of parenting literature, it is expected that parenting dimensions will be related in predictable ways to adolescent outcomes (see Table 5.1, p. 69). Consistent with prior research, it is expected that parental warmth will be positively associated with academic competence, commitment to school, social competence, mastery, and self-worth. Although a negative correlational relationship is expected between parental warmth and both adolescent substance use and problem behaviors, it is expected that when included in analyses along with other parenting dimensions, parental warmth will be overshadowed by the importance of structure in predicting substance use and problem behaviors.

While it is expected that parental warmth will be more strongly related to positive outcomes (i.e., academic and social competence, mastery, and self-worth), parental rejection is expected to have a strong positive relationship to substance use and problem behaviors and strong negative relationships with academic and social

competence and self-worth. These expectations are based on research reported by Fauber and associates (1990) and Delaney (1996). Fauber found parental rejection to be strongly related to problem behaviors. In fact, parental rejection was a far stronger predictor of problem behaviors than both lax control and psychological coercion. Delaney found that adolescents who were detached from their parents showed deficits on self-worth and were more likely to experience emotional problems.

Structure and chaos. Aspects of structure, particularly monitoring and discipline, have been shown to have a strong negative influence on substance use and problem behaviors (Barber, 1996; Barber et al., 1994; Coombs & Landsverk, 1988; Loeber & Dishion, 1983) and a positive relationship with academic performance (Barber & Olsen, 1997; Dornbusch et al., 1987; Herman et al., 1997, Steinberg et al., 1989). Some researchers have also found weak negative relationships between monitoring and internalized problems (Barber et al., 1994) and weak positive relationships between monitoring and self-reliance (Brown et al., 1993). The measure of structure used in this study shifts the focus from monitoring to a broader view that includes clear rules, strategies for solving problems, and consistency. Thus, it is expected that with this broader view, structure will show a stronger relationship to academic competence, self-worth, and mastery while continuing to be negatively associated with substance use and problem behaviors.

Little is known about the relationship of chaos to adolescent outcomes. Fauber et al. (1990) included a measure of lax control (inconsistent monitoring and discipline) in their work which might be considered a measure of chaos. Lax control was

moderately correlated with problem behaviors, but when included in a model along with parental rejection, lax control was not a significant predictor of problem behaviors. As noted above, other researchers have found that failure to monitor adolescent behaviors was associated with poor academic performance (Barber & Olsen, 1997; Dornbusch et al., 1987; Herman et al., 1997; Steinberg et al., 1989) and with substance use and problem behaviors (Barber, 1996; Barber et al., 1994; Coombs & Landsverk, 1988; Loeber & Dishion, 1983). Since the new measure of chaos measures parents' inconsistency and unpredictability, it is expected that this measure will have a strong negative association with academic performance, commitment to school, mastery, and self-worth. Chaos is expected to have a negative relationship with substance use and other problem behaviors.

Autonomy support and coercion. In this study autonomy is indicated by items tapping parental trust, respect, and valuing the child as an individual. While few researchers have attempted to measure autonomy support (Turner et al., 1983 provides an exception), several have explored the relationship between adolescent-parent decision making and adolescent outcomes. It seems likely that parents who include their adolescents in joint decision making are autonomy supportive. Joint decision making has been found to be related to higher GPA, higher levels of school motivation and liking for school, greater self-esteem, and lower levels of drug use (Brown et al., 1993; Eccles et al., 1997). Given these findings, it is expected that autonomy support will be positively related to academic competence, commitment to school, social competence, mastery, and self-worth. While autonomy support is expected to have a

negative correlation with substance use and problem behaviors, it is expected that monitoring and structure will overshadow the importance of autonomy support when both are included in models to predict substance use and problem behaviors.

It was noted earlier that parental use of psychological control has frequently been reverse scored and used as a measure of psychological autonomy. Using this operationalization, absence of psychological control has been positively associated with academic performance and negatively associated with emotional problems such as anxiety and depression and problem behaviors (Barber & Olsen, 1997; Eccles et al., 1997; Herman et al., 1997). Coercion is a construct similar to psychological control and it is expected that coercion will be negatively related to academic performance, mastery and self-worth, and positively related to substance use and problem behaviors.

Table 5.1 summarizes the expected relationships between parenting dimensions and adolescent outcomes. Since substantial multicollinearity is expected among the parenting dimensions, both zero-order correlations and regression coefficients are used in the current study.

Some previous researchers examined the effects of parenting practices on adolescent outcomes separately for girls and boys and found substantial differences. For example, Eccles et al. (1997) found warmth to be predictive of depression for girls, but not for boys, and monitoring to be predictive of academic performance for girls, but not for boys. Barber and Olsen (1997) found monitoring predictive of fewer problem

Table 5.1

Expected Relationships Among Parenting Dimensions and Adolescent Outcomes

	Academic competence	Commit- ment to school	Social compe- tence	Master y	Global self- worth	Substanc e use	Problem behaviors
Warmth	+	+	+	+	+	(-)	(-)
Rejection	--		--	--	--	++	++
Structure/ Monitoring	+	+		+	+	--	--
Chaos	--	--		-	-	+	+
Autonomy support	+	+	+	+	+	(-)	(-)
Coercion	-	-		-		+	+

Note: Symbols (+ and -) indicate the direction and strength of the expected relationships. Parentheses indicate that the relationship is not significant in models including multiple parenting dimensions.

behaviors for girls, but not for boys. In addition, autonomy support was predictive of feelings of depression for boys, but not for girls, and of problem behaviors for girls, but not for boys. These differences in the findings for girls versus boys suggest that there may be interaction effects between parenting dimensions and gender in predicting adolescent outcomes. Given these findings, the current study includes tests for interactions between parenting dimensions and gender in predicting adolescent outcomes.

Are varying combinations of parenting dimensions associated with differential outcomes for adolescents? (Q3)

The literature on parenting types suggests that certain combinations of parenting dimensions tend to co-occur. Through observations of parenting, Baumrind (1971) identified three parenting types and later extended the classification scheme to seven to accommodate parenting types which emerge during adolescence (Baumrind, 1991). In reviewing Baumrind's seven parent types it was noted that these parent types appear to vary in their provision of parental warmth, structure, and autonomy support. For example, authoritative parents appear to provide high levels of warmth, structure, and autonomy support, while authoritarian parents appear to provide lower levels of warmth, high levels of structure, and low levels of autonomy support.

In this study, parent types are identified based on adolescent perceptions of parenting dimensions. After identifying these groups, potential differences in adolescent outcomes will be explored. It is expected, for example, that parents who are perceived as high on warmth, low on structure, and high on autonomy support will have adolescents who are socially competent and self-confident, but may be lower in academic competence and more likely to have tried alcohol and other drugs than youth whose parents are perceived as high on warmth, structure, and autonomy support. This expectation is consistent with Baumrind's democratic parenting style.

Alcohol and Marijuana Use

Since some engagement in problem behaviors appears to be normative, is there some level of engagement in alcohol and marijuana use that does not appear to undermine adolescent functioning? (Q4) Are patterns of parenting different for

adolescents who are regular alcohol and marijuana users versus those who are not?

(Q5)

Following Baumrind's (1987) argument that exploratory risk-taking is normal and necessary during adolescence, adolescent use of alcohol and marijuana is explored in the current study. A measure of overall competence created by combining measures of academic and social competence, commitment to school, and global self-worth is used to indicate adolescent functioning. If a group for whom substance use does not appear to have undermined functioning can be identified, the parenting dimensions associated with this group relative to other adolescents will be examined.

Risk Factors

Do warmth, structure, and autonomy support protect adolescents from risk factors such as having friends who use drugs? (Q6)

Risk factors were defined earlier as those variables which increase the likelihood of adolescent engagement in problem behaviors. Risk factors which have been identified by other researchers include contextual or environmental variables such as laws and norms favorable to drug use, family and individual variables such as having other family members who engage in antisocial behaviors, and behavioral variables such as early onset of problem behaviors (see Chapter 1 for a more complete list) (Catalano & Hawkins, 1996; Hawkins et al., 1992; Jessor et al., 1995).

A set of thirteen risk factors were selected for inclusion in the this study; low neighborhood attachment, community disorganization, transitions and mobility, perceived availability of drugs and handguns, norms favorable to drug use, adult

models for delinquent behavior, low likelihood of being caught, parental acceptance of drug use, parental acceptance of delinquent behavior, interaction with antisocial peers, friends' use of drugs, and rewards for antisocial involvement, lack of rewards for conventional involvement. These constructs have been used previously in the Oregon School Survey (Finigan, 1996) and have been found to be predictive of adolescent substance use and engagement in problem behaviors. Other factors such as family conflict, low family bonding, and early experimentation with alcohol and drugs have not been included in this study. Family conflict and low family bonding are constructs that are likely reflected in measures of warmth and rejection. Risk factors such as early onset of drug use and engagement in other problem behaviors have been excluded from this study since the objective is to understand what factors may contribute to problem behaviors.

Parental involvement and family bonding have been promoted as factors which protect adolescents from the detrimental effects of risk (Catalano & Hawkins, 1996; Hirschi, 1969). However, as noted earlier, few studies have explored whether potential protective factors actually moderate the relationship between risk factors and adolescent outcomes by testing interactions between risk and protective factors. There is some evidence that authoritative parenting provides protection against the effects of drug-using peers. However, since Mounts and Steinberg (1995) combined parenting dimensions to form the authoritative category, it is not clear which parenting dimensions may have contributed to the results. This study explores whether parental warmth, structure, and autonomy support operate as protective factors.

Five hypotheses corresponding to the research questions will be explored:

Hypothesis 1 (H1): Factor analysis will result in the confirmation of six dimensions of parenting with the following relationships to adolescent academic competence, commitment to school, social competence, mastery, self-worth, substance use, and problem behaviors. (Q1 and Q2)

A. Parental warmth will be positively associated with academic competence, commitment to school, social competence, mastery and self-worth. A weaker negative relationship is expected between parental warmth and substance use and between warmth and problem behaviors.

B. Parental rejection will be positively associated with substance use and problem behaviors, and negatively associated with academic competence, social competence, mastery, and self-worth.

C. Structure will have positive relationships with academic competence, commitment to school, mastery, and self-worth, and negative relationships with substance use and problem behaviors.

D. Chaos will have a negative association with academic competence, commitment to school, mastery, and self-worth. Chaos will have significant simple correlations with substance use and problem behaviors, but will not explain substantial variance in substance use and problem behaviors when included in analyses with other dimensions of parenting.

E. Autonomy support will be positively related to academic competence, commitment to school, social competence, mastery, and self-worth, and negatively associated with substance use and problem behaviors.

F. Coercion will be negatively related with academic competence, commitment to school, and mastery, and positively related to substance use and problem behaviors

Hypothesis 2 (H2): Groups of adolescents with varying combinations of perceived parental scores on parenting dimensions will have different patterns of outcome variables. (Q3)

Hypothesis 3 (H3): Adolescents who are triers of alcohol and marijuana, but who do not engage in monthly or more frequent use of alcohol or marijuana will score as well on a measure of overall competence as nonusers of alcohol and marijuana. (Q4)

Hypothesis 4 (H4): Patterns of parenting dimensions will be different for frequent alcohol and marijuana users vs. low level users. (Q5)

Hypothesis 5 (H5): Parental warmth, structure, and autonomy support will moderate the relationships between adolescent risk factors and problem behaviors and between risk factors and substance use. Specifically, stronger positive relationships are expected between risk factors and problem behaviors and between risk factors and substance use when parental warmth, structure, and autonomy support are low. (Q6)

Method

Participants

Participants included 4,090 students enrolled in grades 8-12 in 54 schools across Oregon; 48% were boys and 52% were girls. Students ranged in age from 13 to 19 years with a mean age of 15.2 years. By grade, 30% were in grade 8, 29% in grade 9, 19% in grade 10, 18% in grade 11, and 4% in grade 12. The race/ethnicity of the students was 78% White non-Hispanic, 7% Hispanic, 6% Asian, 6% American Indian, and 3% African American. Participants lived in a variety of family situations; 55% lived with two parents; 22% lived in homes with one parent, 19% lived in blended families with a step parent and/or step siblings, and 4% lived in nontraditional settings with foster parents, extended family members, or unrelated adults.

Procedure

Participants were recruited with assistance from the Oregon Office of Alcohol and Drug Abuse Prevention (OADAP) to participate in a survey of Oregon public school youth. Fifty-four schools were randomly selected from five regions of Oregon for inclusion in the study. Schools that refused to participate were replaced by randomly selected schools from the same region.

The questionnaire was administered in social studies classes and proctored by a representative from Northwest Professional Consortium (NPC), the company administering the overall survey. Students who did not participate were given an alternate activity under supervision of their classroom teacher.

Measures

The data used in the current study represent a subset of the measures used in the School Survey as well as additional items added for the purpose of this study. The questionnaire included demographics, measures of parenting dimensions, risk factors for adolescent problem behaviors, and a variety of adolescent outcome measures. Demographics included sex, age, parents' education, ethnic background, and living situation (i.e., whether or not the adolescent lives in a one-parent, two parent, or some other family situation). Since the data were collected as part of a larger study of adolescent behaviors, not all of the data collected were used in the current study.

Parenting dimensions. Parenting dimensions were measured using a recently developed set of items designed to measure warmth, rejection, structure, chaos, autonomy support, and coercion. This child report of parenting inventory included 48 items with responses measured on a 4-point scale: *not at all true (1)*, *not very true (2)*, *sort of true (3)*, *very true (4)*. The 48-items were used to construct six subscales; warmth, rejection, structure, chaos, autonomy support, and coercion. Reliability coefficients for the six dimensions based on all 48 parenting items ranged from .83 to .90 and appear in Appendix A.

The six subscales were subsequently refined to include 24 of the original 48 items. Means of the items answered for each subscale were calculated and used as the score for a parenting dimension if 75% of the items for that subscale were answered. Reliability for the coefficients for the six dimensions based on 24 items ranged from .71 to .88 and appear in Appendix B.

Parental monitoring. In addition to the parenting dimensions described above, parental monitoring was measured using items from the *Oregon Public School Drug Use Survey* (Arthur, Hawkins, Catalano, & Pollard, 1997). Four items measured parental monitoring: (1) *The rules in my family are clear.* (2) *My parents would know if I did not come home on time.* (3) *When I am not at home, one of my parents knows where I am and who I am with.* (4) *My parents want me to call if I'm going to be late getting home.* Responses were measured on a 4-point scale: *not at all true* (1), *not very true* (2), *sort of true* (3), *very true* (4). Mean scores were calculated to represent parental monitoring if at least three (75%) of the four monitoring items were answered. Reliability for the parental monitoring scale was .77.

Risk factors. Measures of each adolescent's risk for problem behaviors were based on scales from the *Oregon Public School Drug Use Survey* (Arthur, Hawkins, Catalano, & Pollard, 1997). Thirteen risk factors were measured: low neighborhood attachment, community disorganization, transitions and mobility, perceived availability of drugs and handguns, norms favorable to drug use, adult models for delinquent behavior, low likelihood of being caught, parental acceptance of drug use, parental acceptance of delinquent behavior, interaction with antisocial peers, friends' use of drugs, rewards for antisocial involvement, and lack of rewards for conventional involvement. The items for each risk factor, their associated response scales, and reliability coefficients are displayed in Appendix C. Reliability coefficients for the risk factor scales ranged from .72 to .90. Higher risk factor scores indicate greater risk of substance use and problem behaviors. Since the risk factor scales contain varying

numbers of items which are measured on a variety of response scales, the items were standardized before they were combined to create risk factor scores. Means for each risk factor were calculated if the respondent completed at least 75% of the items representing the risk factor.

After calculating risk factor scores, an overall risk score was calculated for each student using a two step process. First, 13 dichotomous risk factor variables corresponding to the thirteen risk factors were created. A student received a score of one on the dichotomous variable if that student scored one or more standard deviations above the mean on the corresponding risk factor. The student received a score of zero on the dichotomous risk factor variable if he or she scored less than one standard deviation above the mean. Next, the thirteen dichotomous risk factor variables were summed to calculate the overall risk score. If a student had four or more missing values in the set of risk factors, the overall risk factor score was not calculated.

Academic competence. Self-reported grades and perceived academic competence were used as indicators of academic competence. Perceived academic competence and self reported grades were standardized and summed to create the academic competence score. Reliability for academic competence using the sum of the standardized scores was .76.

Students were asked to select the category which represented their usual grades: mostly F's, mostly F's and D's, mostly D's, mostly C's and D's, mostly C's, mostly C's and B's, mostly B's, mostly B's and A's, mostly A's. A numerical scale of

self-reported grades was constructed ranging from 0 (mostly F's) to 4.0 (mostly A's). Mean self-reported grades across all respondents was 2.9.

Evidence from other research indicates that self-reported grades provide a reasonable surrogate for official grade point averages. Dornbusch et al. (1987) explored the relationship between self-reported and school recorded grades and concluded that self-reported grades provide a close approximation of the distribution of grades on student transcripts. The correlation between these two measures was quite high $r = .79$). There was, however, a slight tendency for students with mean grades below a C to slightly overstate their grades.

Perceived academic competence was measured using the *Scholastic Competence* subscale from Harter's (1988) *Self-Perception Profile for Adolescents*. This subscale taps students' perceptions of their academic ability, how well they are doing at class work, and how intelligent they feel. Five items are included in the subscale, each measured on a four-point scale (see Appendix D).

Although Harter's Self-Perception Profile has been used in a wide variety of studies by other researchers, students responding to the current survey seemed to be confused by the format in which the items were presented. This confusion probably resulted from modifications made to the instructions. In an effort to control the length of the questionnaire, Harter's instructions were modified and a sample item omitted. Using the modified instructions, approximately 20% of the adolescents surveyed marked two answers for each item rather than the intended single answer (See Appendix D for the instructions used). An additional 12% of the respondents failed to

complete at least four of the five items used to measure perceived academic competence. The placement of items from the Self-Perception Profile near the end of a lengthy questionnaire may have contributed to the substantial percentage of missing data.

Following Harter's procedures for creating the subscales associated with the Self-Perception Profile, items with two answers would be invalid and counted as missing data. Combining those who marked two answers with those who failed to answer at least four of the five academic competence items results in nearly one-third of the subjects being coded as having missing data on perceived academic competence. Given the format of the items, it was determined that a set of decision rules could be created that would include many of the students answering with two responses per item without substantially altering the meaning of the subscale. As devised by Harter, each item contained two phrases. Students were instructed to determine whether they were more like the teenagers on the left side of the statement or more like the teenagers described in the contrasting phrase on the right side. Students were then instructed to mark one answer corresponding to the phrase that was most like them. The following decision rules were used to handle items with two responses:

- 1) Students who answered that one phrase was "really true for me" and the contrasting phrase was "sort of true for me" were scored as if they had chosen only the "really true for me" phrase.

2) Students who responded “sort of true for me” for both of the contrasting phrases in a statement were assigned a score of 2.5 (the midpoint of the two values).

3) Responses from students selecting “really true for me” for both phrases were considered inconsistent and coded as missing.

Based on these procedures an additional 695 respondents were included in the analyses. Mean scores on perceived academic performance were calculated for respondents who answered at least four of the five items comprising academic competence or for whom at least four of the five items could be imputed. Reliability coefficients for perceived academic competence were comparable for the revised procedures and Harter’s original procedures. The correlations of perceived academic competence and self-reported grades were also comparable regardless of whether the original or revised procedures were used to calculate perceived academic competence (Table 5.2).

Table 5.2

Academic Competence: Harter’s procedures versus revised procedures.

	Harter’s Procedures	Revised Procedures
Number of Students Included	2,785	3,480
Reliability Coefficient	.79	.77
Correlation with Self-Reported Grades	.51	.48

Social competence. The *Social Acceptance* subscale from Harter's (1988) *Self-Perception Profile for Adolescents* was used to measure social competence (Appendix D). This subscale focuses on the adolescents' perceptions of acceptance by peers, feelings of popularity, and feelings that they are easy to like. This subscale was scored using the procedure described for perceived academic competence. Mean scores were calculated for respondents who answered at least four of the five items comprising social competence or for whom at least four of the five items could be imputed. Use of the decision rules described above resulted in the inclusion of 668 respondents who would have been coded as having missing data on social competence under Harter's procedures. Reliability for the social competence subscale was .80 using the revised procedures and .82 using Harter's procedure.

Self-worth. The global self-worth subscale from the *Self-Perception Profile* (Harter, 1988) was used to measure self-worth (Appendix D). This subscale measures the extent to which adolescents like themselves and are happy with their lives. The revised procedure used for calculating perceived academic competence and social competence was used to calculate self-worth. Means on self-worth were calculated for those students who answered at least four of the five self-worth items or for whom four of the five self-worth items could be imputed. The revised procedures using the decision rules described above resulted in 684 additional respondents for whom a self-worth score could be calculated. Reliability using the revised procedure was .83 compared to .86 for Harter's procedure.

Commitment to school. The subscale included in the *Oregon Public School Drug Use Survey* (Arthur, Hawkins, Catalano, & Pollard, 1997) to measure lack of school commitment was reversed and used to measure school commitment (see Appendix E). Items were scored in the current study so that higher scores indicate greater commitment to school. Reliability for this subscale was .81.

Mastery. Pearlin's measure of mastery (Pearlin, Lieberman, Menaghan, & Mullan, 1981) was used to measure adolescents' perceptions of personal control. The mastery scale items and the response scale are displayed in Appendix E. Items were scored so that higher numbers indicate greater mastery. Mean mastery scores were calculated for those students who answered at least six of the seven mastery items. Reliability for the mastery scale was .76.

Overall competence. A measure of overall competence was created by standardizing and calculating a mean score on the following subscales: self-reported grades, perceived academic competence, social competence, commitment to school, global self-worth, and mastery. Means were calculated for those students with scores on at least five of the six subscales. Overall competence has been used as a surrogate for successful adolescent functioning. Reliability for the overall competence score was .76.

Substance use. Students were asked on how many occasions (if any) during their lifetime, the past 12 months, and the past 30 days they have used alcoholic beverages, marijuana, LSD and other psychedelics, methamphetamines, cocaine or crack, heroin, and tranquilizers, quaaludes, or barbiturates without a doctor's orders.

Students were also asked if they had sniffed glue, breathed the contents of an aerosol spray can, or inhaled other gases or sprays in order to get high during the past 12 months and during the past 30 days. The response options were coded as follows: 0 occasions (0), 1 - 2 occasions (1), 3 - 5 occasions (2), 6 - 9 occasions (3), 10 - 19 occasions (4), 20 - 39 occasions (5), 40 or more occasions (6). A substance use score was calculated by standardizing and summing the responses (0-6) for each drug item. The responses for individual items were standardized so as to increase the weight given to infrequent responses. Since more dangerous substances such as heroin had a relatively low frequency of use, they also had a lower standard deviation than more frequently used substances. The overall effect of standardizing was to give greater weight to responses indicating heroin use.

Use of alcohol and marijuana were recoded as follows for use in some analyses:

(0) *Nonusers*. This group includes adolescents who reported no alcohol or marijuana use. (1) *Triers of alcohol*. This group included adolescents who have used alcohol on no more than 3-5 occasions during their lifetime, and on no more than two occasions in the past 30 days. (2) *Triers of marijuana*. These respondents have used marijuana on no more than 3-5 occasions in their lifetime, and on no more than two occasions in the past 30 days. They may also be triers of alcohol. (3) *Recreational users of alcohol and marijuana*. This group used alcohol or marijuana on at least 3-5 occasions in the past 30 days or no more than 6-9 occasions in the past year. (4) *Regular users*. This group used alcohol or marijuana on 6-9 occasions in the past month, or on ten or more

occasions in the past year. (5) *Heavy users*. These adolescents used alcohol and marijuana on 10 or more occasions in the past month, or on 20 or more occasions in the past year.

Problem behaviors. Students reported the number of times in the past twelve months that they had driven a vehicle after drinking alcohol or using illegal drugs, ridden in a vehicle with a teenage driver who had been drinking or using illegal drugs, been drunk or high at school, carried a handgun, taken a handgun to school, sold illegal drugs, stolen something worth over \$5, stolen or tried to steal a motor vehicle, attacked someone with the idea of seriously hurting them, and been in a fight using a weapon. Response options were as follows: 0 occasions (0), 1 - 2 occasions (1), 3 - 5 occasions (2), 6 - 9 occasions (3), 10 - 19 occasions (4), 20 - 39 occasions (5), 40 or more occasions (6). A problem behavior score was calculated by standardizing and summing the responses (0-6) for each problem behavior category. As with substance use, more serious problem behaviors had lower frequencies and thus received greater weight through standardizing.

Overall problem behaviors. For some analyses, measures of substance use and problem behaviors were combined (summed) to indicate overall problem behaviors. The correlation between substance use and problem behaviors was high, $r = .78$.

Race. Race/ethnicity was used as a control variable in regression models predicting adolescent outcomes. Since preliminary analyses found differences by race/ethnicity across all outcomes with other races generally being different from

White non-Hispanics, race was recoded for use as a control variable as white = 0, non-white = 1.

Family type. Family type was used as a control variable in regression models predicting adolescent outcomes. Preliminary analyses indicated significant differences on most outcome variables for two-parent family versus other family types. Therefore, family type was recoded into 0=lives with two parents, 1=other living situation.

Chapter 6

Measurement of Parenting Dimensions

This chapter examines whether there are three or six parenting dimensions and how those parenting dimensions are related to adolescent behaviors and outcomes. The specific hypothesis examined was:

(H1) Factor analysis will result in the confirmation of six dimensions of parenting; warmth, rejection, structure, chaos, autonomy support, and coercion. These are expected to have the following relationships to adolescent academic competence, commitment to school, social competence, mastery, self-worth, substance use, and problem behaviors:

A. Parental warmth will be positively associated with academic competence, commitment to school, social competence, mastery and self-worth.

A weaker negative relationship is expected between parental warmth and substance use and between warmth and problem behaviors.

B. Parental rejection will be positively associated with substance use and problem behaviors, and negatively associated with academic competence, social competence, mastery, and self-worth.

C. Structure will have positive relationships with academic competence, commitment to school, mastery, and self-worth, and negative relationships with substance use and problem behaviors.

D. Chaos will have a negative association with academic competence, commitment to school, mastery, and self-worth. Chaos will have significant simple correlations with substance use and problem behaviors, but will not explain substantial variance in substance use and problem behaviors when included in analyses with other dimensions of parenting.

E. Autonomy support will be positively related to academic competence, commitment to school, social competence, mastery, and self-worth, and negatively associated with substance use and problem behaviors.

F. Coercion will be negatively related with academic competence, commitment to school, and mastery, and positively related to substance use and problem behaviors.

The procedures used to test H1 are described below. Several steps were needed. Steps 1-3 describe the refinement of the measurement model that defined the parenting dimensions. Step 4 includes the procedures necessary to test the three- versus six-dimension parenting models, and step 5 includes procedures to examine the relationships among parenting dimensions and adolescent outcomes.

1. Confirmatory factor analysis was used to test how well a set of newly developed items designed to measure warmth, rejection, structure, chaos, autonomy support, and coercion represented those constructs.

2. Next, exploratory factor analysis was used to refine and reduce the set of 48 parenting items.

3. After refining the model with exploratory factor analysis, confirmatory factor analysis was used to test the goodness of fit of the refined model and to further reduce the set of parenting items to 24.

4. Confirmatory factor analysis was used to compare the fit of the three-dimension and six-dimension parenting models.

5. Finally, correlational and multiple regression analyses were used to examine the relationships among specific parenting dimensions and adolescent outcomes and behaviors.

Confirmatory Factor Analysis using the Original 48 Items

Before the question of whether there are three or six parenting dimensions could be addressed, the new parenting items that were developed to measure warmth, rejection, structure, chaos, autonomy support and coercion were analyzed and specific items were selected to create the subscales (parenting dimensions) used in subsequent analyses. Each of the six parenting dimensions were originally represented by eight items. Confirmatory factor analysis was used to determine how well these items represented the hypothesized dimensions. Factor loadings and squared multiple correlations are displayed in Table 6.1. All of the factor loadings were relatively strong (greater than .40) and significantly different from zero, $p < .001$. The squared multiple correlations indicated that, with only two exceptions, over 25% of the variation in each of the items was explained by its corresponding parenting dimension. Only 17% of the variation in the item *My parents expect me to follow our family rules* was explained by

Table 6.1

Factor Loadings and Squared Multiple Correlations for the Original 48 Parenting Items

Dimension/Item	Factor Loading	Squared Multiple Correlation
Warmth		
My parents let me know they love me.	.77	.60
My parents are glad I am their child.	.77	.59
My parents enjoy being with me.	.83	.69
My parents are always glad to see me.	.78	.62
My parents think I'm special.	.74	.55
My parents are happy with me just the way I am.	.77	.60
My parents can tell how I'm feeling without asking.	.57	.32
My parents understand me very well.	.71	.50
Rejection		
Sometimes I wonder if my parents like me.	.75	.56
My parents do not really love me.	.56	.32
My parents think I'm always in the way.	.69	.47
My parents don't say much about the good things I do, but they are always talking about the bad.	.71	.50
My parents make me feel like I'm not wanted.	.73	.53
When I am upset, my parents don't care.	.64	.40
Nothing I do is good enough for my parents.	.78	.60
My parents pick on me for every little thing.	.70	.49
Structure		
When I want to do something, my parents show me how.	.62	.38
When I want to understand how something works, my parents explain it to me.	.74	.55
If I ever have a problem, my parents help me to figure out what to do about it.	.72	.52
My parents show me how to do things for myself.	.62	.38
My parents expect me to follow our family rules.	.41	.17
My parents explain the reasons for our family rules.	.70	.49
My parents keep their promises.	.72	.52
When my parents tell me they'll do something, I know they will do it.	.64	.41

(Table continues)

Table 6.1 (continued)

Factor Loadings and Squared Multiple Correlations for the Original 48 Parenting Items

Dimension/Item	Factor Loading	Squared Multiple Correlation
Chaos		
When my parents make a promise, I don't know if they will keep it.	.68	.46
When my parents say they will do something, sometimes they don't really do it.	.64	.41
When I do something wrong, I never know how my parents will react.	.50	.25
My parents keep changing the rules on me.	.64	.41
My parents get mad at me with no warning.	.75	.56
My parents punish me for no reason.	.69	.47
A lot of times, I don't know where my parents are.	.48	.23
I never know what my parents will do next.	.50	.25
Autonomy Support		
My parents trust me.	.70	.49
My parents accept me for myself.	.78	.61
My parents let me do the things I think are important.	.69	.47
My parents encourage me to be true to myself.	.73	.53
My parents expect me to say what I think.	.58	.34
My parents try to understand my point of view.	.76	.57
When my parents ask me to do something, they explain why.	.54	.29
My parents want to know what I think about how we should do things.	.67	.45
Coercion		
My parents are always telling me what to do.	.73	.54
My parents boss me.	.77	.60
My parents try to control everything I do.	.70	.49
My parents think there is only one right way to do things-their way.	.78	.60
The only reason my parents give is "Because I said so."	.56	.31
My parents say "no" to everything.	.72	.51
I'm not allowed to disagree with my parents.	.40	.16
My parents think that they know best about everything.	.60	.36

Note. All factor loadings are significant, $p < .001$.

$N = 3,752$

structure, and 16% of the variation in *I'm not allowed to disagree with my parents* was explained by coercion.

Despite the relatively strong factor loadings and acceptable squared multiple correlations, the model's goodness of fit measures were relatively low (Table 6.2). The model's goodness of fit index (GFI) and adjusted goodness of fit index (AGFI) were .84 and .83. A model with good fit would have GFI and AGFI over .90. In addition, correlations among the parenting dimensions were strong (Table 6.3), and modification indices suggested that many of the items cross-loaded on other dimensions. Taken together, these findings indicate a poor fitting measurement model.

Table 6.2

Fit Measures for Confirmatory Factor Analysis on the Original
48 Parenting Items

X^2	12,665
df	1,065
$p <$	.001
GFI	.84
AGFI	.83
CFI	.88
PCFI	.83
RMSR	.04

Note. GFI=Goodness of Fit Index; AGFI=Adjusted Goodness of Fit Index;
CFI=Comparative Fit Index; PCFI=Parsimony-adjusted CFI; RMSR=Root Mean
Square Residual.

$N = 3,752$

Table 6.3

Inter-Factor Correlations for the Original 48 Parenting Items

Parenting Dimension	1	2	3	4	5	6
1. Warmth	--					
2. Rejection	-.78	--				
3. Structure	.91	-.69	--			
4. Chaos	-.62	.92	-.64	--		
5. Autonomy Support	.94	-.77	.93	-.66	--	
6. Coercion	-.51	.82	-.48	.85	-.63	--

Note. All correlations are significant, $p < .05$.

$N = 3,752$

Exploratory Factor Analysis to Refine and Reduce the Set of 48 Items

Since confirmatory factor analysis indicated that the factors were highly correlated and included some cross-loading items, a series of exploratory factor analyses were conducted to guide modifications to the model. An initial exploratory factor analysis using principal axis factoring and oblique rotation which permits the factors to be intercorrelated resulted in a four factor solution. One factor represented positive parenting (i.e., including items constructed to represent warmth, structure, and autonomy support) and three factors represented negative parenting. Although there was substantial cross-loading of variables on multiple factors, the three negative parenting factors appeared to approximate rejection, chaos, and coercion.

In an effort to remove at least some of the difficulties of intercorrelation among the dimensions, further exploratory analyses of positive parenting items and the negative parenting items were conducted separately. A series of exploratory factor analyses were undertaken in an attempt to achieve a simple structure in which any given item loaded strongly on a single factor, and loadings of items on each factor were either high or low. The following summarizes the procedure used.

Positive Parenting Dimensions:

- 1) In a series of analyses, four warmth items (Appendix A, items 5-8) that loaded on both warmth and on a factor that included primarily autonomy support items were removed.
- 2) After removal of the cross-loading warmth items, three items that were intended to measure structure, but failed to load strongly on any of the

factors, were removed (Appendix A, items 21, 23 and 24). In addition, an item which was intended to be associated with structure, but was more closely related to the autonomy support items, was removed (Appendix A, item 18).

3) Finally, three autonomy support items that cross-loaded with the structure dimension were removed (Appendix A, items 37, 39 and 40).

Since parental monitoring had been identified by other researchers as an important predictor of adolescent outcomes and the newly developed structure items did not include specific monitoring items, four items included in the *Oregon Public School Drug Use Survey* (Arthur, Hawkins, Catalano, & Pollard, 1997) were included in another set of factor analyses. The monitoring items were expected to combine with the structure items to form a single factor. Instead, the monitoring items formed a separate factor that included only one of the structure items, *My parents expect me to follow our family rules*. Since the monitoring items formed a separate factor, monitoring items are not represented in the six parenting dimensions based on the motivational model. However, due to the importance of monitoring in the literature addressing parenting of adolescents, a seventh monitoring dimension was used in subsequent analyses involving adolescent outcomes.

A procedure similar to the one used to refine the set of positive parenting items was used to refine the negative parenting items. First, the items which were expected to load on rejection but which cross-loaded on some other dimension, or did not load strongly on any dimension, were removed in a series of steps. Next, the operations were repeated examining chaos and then coercion. The end result of this process was a set of

27 items which met criteria for simple structure, that is, they loaded predominantly on one dimension.

Confirmatory Factor Analysis to Test the Goodness of Fit of the Refined Model

Next, the 27 items identified to represent the six parenting dimensions using exploratory factor analyses were used in a confirmatory factor analysis. The purpose was to generate goodness of fit measures for the 27-item model that could be compared to the goodness of fit measures for the 48-item model. In addition, a confirmatory factor analysis that included four items per dimension (a 24-item model) was conducted to determine whether a parsimonious solution, with four items as indicators of each dimension, would adequately represent the dimensions.

Comparisons of the fit measures for these alternative models appear in Table 6.4. Both the 24-item and the 27-item models fit substantially better than the 48-item model. Measures of fit for the 24-item and 27-item models were nearly identical. Both had Goodness of Fit Index (GFI) and an Adjusted Goodness of Fit Index (AGFI) over .90, the level at which a model can be considered to have a good fit. The Comparative Fit Index (CFI), which allows comparisons between models, was .96 for the 24-item model and .95 for the 27-item model. Factor loadings and squared multiple correlations were nearly identical for the parenting dimensions as represented by 24-item and 27-item models. Since it was more parsimonious, the 24-item model was used in the remainder of analyses that examine parenting dimensions. Factor loadings and squared multiple correlations appear in Table 6.5. All of the factor loadings were greater than

.50, and the parenting dimensions explained 26 to 74 percent of the variance in their corresponding items.

Table 6.4

Fit Measures for Alternative Confirmatory Factor Analysis Models

Measure of Fit	Model		
	24-Item	27-Item	48-Item
X^2	2,049	2,702	12,665
df	237	309	1,065
$p <$	.001	.001	.001
GFI	.95	.95	.84
AGFI	.94	.93	.83
CFI	.96	.95	.88
PCFI	.82	.84	.83
RMSR	.03	.03	.04

Note. GFI=Goodness of Fit Index; AGFI=Adjusted Goodness of Fit Index; CFI=Comparative Fit Index; PCFI=Parsimony-adjusted CFI; RMSR=Root Mean Square Residual.

$N = 3,752$

Table 6.5

Factor Loadings and Squared Multiple Correlations (SMC): 24-Item Parenting Model

Dimension/Item	Factor Loading	SMC
Warmth		
My parents let me know they love me.	.78	.61
My parents are glad I am their child.	.80	.64
My parents enjoy being with me.	.86	.74
My parents are always glad to see me.	.80	.65
Rejection		
Sometimes I wonder if my parents like me.	.77	.59
My parents do not really love me.	.60	.36
My parents think I'm always in the way.	.71	.51
My parents make me feel like I'm not wanted.	.75	.57
Structure		
When I want to do something, my parents show me how.	.62	.38
If I ever have a problem, my parents help me to figure out what to do about it.	.74	.55
My parents show me how to do things for myself.	.64	.40
My parents explain the reasons for our family rules.	.71	.50
Chaos		
When my parents make a promise, I don't know if they will keep it.	.76	.58
When my parents say they will do something, sometimes they don't really do it.	.69	.48
A lot of times, I don't know where my parents are.	.54	.29
I never know what my parents will do next.	.51	.26
Autonomy Support		
My parents trust me.	.71	.50
My parents accept me for myself.	.81	.65
My parents encourage me to be true to myself.	.74	.54
My parents try to understand my point of view.	.74	.55
Coercion		
My parents are always telling me what to do.	.71	.50
My parents boss me.	.80	.63
My parents say "no" to everything.	.73	.53
My parents think there is only one right way to do things—their way.	.78	.61

Note. All factor loadings were statistically significant, $p < .05$.

In addition, although the parenting dimensions remain highly correlated, interdimension correlations were reduced compared to the 48-item model (see Table 6.6 and Table 6.3). The largest inter-factor correlation for the 24-item solution was .87. For the 48-item solution, inter-factor correlations between four of the pairs were greater than .90.

Table 6.6

Inter-Factor Correlations for the 24-Item Parenting Model

Factor/Parenting Dimension	1	2	3	4	5
1. Warmth	--				
2. Rejection	-.73	--			
3. Structure	.87	-.62	--		
4. Chaos	-.51	.80	-.54	--	
5. Autonomy Support	.86	-.76	.86	-.58	--
6. Coercion	-.46	.72	-.49	.69	-.63

Note. All correlations are significant, $p < .01$.

Parenting Dimensions

Using the 24-item six-factor solution, composite scores were created for the six hypothesized parenting dimensions. Means and standard deviations for the six hypothesized parenting dimensions and for monitoring are displayed in Table 6.7. Respondents gave their highest ratings to monitoring and warmth items. Warmth, structure, autonomy support, and monitoring had positively skewed mean ratings, falling between three and four on a four-point scale. Rejection and chaos were

Table 6.7

Parenting Dimension Composite Scores: Means and Standard Deviations

Parenting Dimension	Mean	Standard Deviation	<i>N</i>
Warmth	3.42	.69	3941
Structure	3.00	.70	3930
Autonomy Support	3.20	.73	3821
Rejection	1.61	.71	3836
Chaos	2.15	.70	3912
Coercion	2.40	.71	3845
Monitoring	3.45	.61	4013

negatively skewed. The rejection items were least likely to be perceived as true, receiving a rating of 1.61 on a scale ranging from one to four.

Correlations among the composite scores on the parenting dimensions (including monitoring) are displayed in Table 6.8. All of the correlations were significant ($p < .01$) with the highest correlations between Warmth, Structure, and Autonomy Support.

These correlations indicate a substantial degree of multicollinearity among the parenting dimensions.

The net result of these processes is a measurement model for the theoretical constructs introduced in Chapter 2. This model consists of 24 items used to create composite scores on six dimensions of parenting behavior, as perceived by adolescent

Table 6.8

Correlations Among Parenting Dimension Composite Scores

Parenting Dimension	Warmth	Structure	Autonomy Support	Rejection	Chaos	Coercion
Warmth	--					
Structure	.71	--				
Autonomy Support	.74	.70	--			
Rejection	-.62	-.48	-.62	--		
Chaos	-.39	-.38	-.45	.62	--	
Coercion	-.30	-.29	-.45	.53	.50	--
Monitoring	.50	.52	.41	-.32	-.27	-.04

Note: All correlations are significant, $p < .01$

respondents. The dimensions have substantial correlation with one another, but sufficient separation to indicate that adolescents can reliably report distinctions in their parents' behaviors consistent with the dimensions expected from the motivational theory.

Three-Dimension versus Six-Dimension Parenting Models

After refining the measurement model, confirmatory factor analysis was used to compare the three-dimension and six-dimension models. Measures of fit for the two models are displayed in Table 6.9. As expected, given the large sample size, both the three- and six-dimension models had significant chi squared values. However, the chi

Table 6.9

Fit Measures for Six-Factor and Three-Factor Confirmatory Factor Analysis Models

Measure of Fit	Model	
	Six-Factor	Three-Factor
X ²	2,049	9,466
df	237	249
p <	.001	.001
GFI	.95	.71
AGFI	.94	.66
CFI	.96	.80
PCFI	.82	.72
RMSR	.03	.09

Note. GFI=Goodness of Fit Index; AGFI=Adjusted Goodness of Fit Index; CFI=Comparative Fit Index; PCFI=Parsimony-adjusted CFI; RMSR=Root Mean Square Residual.

N = 3,752

squared to degrees of freedom ratio for the six-dimension model was substantially lower than for the three-dimension model indicating a better fit. In addition, all of the goodness of fit measures indicate substantially better fit for the six-dimension model. The six-dimension model had goodness of fit (GFI) and adjusted goodness of fit (AGFI) indices of .95 and .94 respectively. GFI and AGFI for the three-dimension model were substantially below acceptable levels at .71 and .66 respectively. The comparative fit index (CFI) which permits comparisons between models, was .96 for the six-dimension

model and .80 for the three-dimension model. Based on measures of fit, the six-dimension model clearly fits the data better than the three-dimension model.

Parenting Dimensions and Adolescent Outcomes

After it was determined that the hypothesized six-dimension parenting model fit the data substantially better than a three-dimension bipolar model, it was no longer necessary to focus on the specific number of parenting dimensions, and the decision was made to include monitoring as a seventh parenting dimension in all remaining analyses. The review of parenting literature highlighted the importance of parental monitoring during adolescence. Since monitoring was not represented in the measure of structure developed for this study, the monitoring items used in the *Oregon Public School Drug Use Survey* were combined and used as a measure of parental monitoring in the current study.

Three sets of analyses were used to determine how parenting dimensions are related to adolescent outcomes (parts A through F of H1):

1. Since substantial multicollinearity among the parenting dimensions was expected, zero order correlations were examined to determine the direction and strength of the relationships between parenting dimensions and each of the adolescent outcomes: academic competence, commitment to school, social competence, mastery, self-worth, overall competence, substance use, problem behaviors, and overall problem behaviors.
2. A few studies reported differences in findings for girls versus boys suggesting the potential for interactions between parenting dimensions and gender (Barber & Olsen, 1997; Eccles et al., 1997; Werner & Silbereisen, 2003). Based on these findings,

interactions of parenting dimensions with gender were tested for each of the adolescent outcomes. After testing for gender interactions, some regression coefficients were observed to have unexpected signs. Possible explanations for flipped signs include the presence of a suppressor variable or an interaction term that has not been specified.

After ruling out potential suppressor variables through the examination of partial correlations, a series of four interactions among the parenting dimensions were tested: warmth with coercion, structure with coercion, monitoring with coercion, and autonomy support with chaos. Based on theoretical considerations (Grolnick, Ryan & Deci, 1991) and discussions with colleagues, it was hypothesized that among adolescents whose parents were perceived as high on coercion, high levels of parental warmth, structure and monitoring, instead of being experienced as involvement, may be perceived as intrusive and lead to poorer outcomes. It was also hypothesized that when parental chaos is high, autonomy support, instead of being experienced as freedom, may be experienced as chaos and lead to poorer adolescent outcomes. Separate regression models were used to test for each of the interactions.

3. The interactions that were identified as significant ($p \leq .01$) in step 2 above were included in combination in regression models predicting each of the adolescent outcome variables. Gender, grade, race, and family type were also included in the full regression models. These full regression models were subsequently revised so that interactions that were not statistically significant when included in combination were dropped.

Zero Order Correlations. Based on generalizations from the studies reviewed earlier, specific relationships between parenting dimensions and adolescent outcomes were expected. The adolescent outcomes included in this study were academic competence, commitment to school, social competence, self-worth, mastery, substance use and problem behaviors. In addition, the potentially positive adolescent outcomes (academic competence, commitment to school, social competence, self-worth, and mastery) were standardized and combined to form an aggregate measure of overall competence. Substance use and other problem behaviors were standardized and combined to form a measure of overall problem behaviors.

Table 6.10 displays means standard deviations, minimum and maximum scores on the outcome variables for the total sample, boys, and girls. For academic competence, commitment to school, social competence, self-worth, mastery and overall competence, higher scores indicate better outcomes. For substance use, problem behaviors, and overall problem behaviors, higher scores indicate engagement in more problem behaviors. Academic competence, overall competence, substance use, problem behaviors and overall problem behaviors were calculated by summing standardized variables making negative values and near zero means possible. Comparison of the means for boys and girls shows that means were significantly higher ($p < .01$) for girls on academic competence, commitment to school, social competence, and overall competence. Means were significantly higher ($p < .01$) for boys on self-worth, substance use, problem behaviors, and overall problem behaviors.

Table 6.10

Adolescent Outcomes: Means, Standard Deviations Minimum and Maximum Scores

Parenting Dimension	Mean	Standard Deviation	Minimum	Maximum	N
Academic competence	.08	1.69	-4.47	2.73	3463
Boys	-.08*	1.69	-5.32	2.73	1553
Girls	.21	1.68	-5.47	2.73	1810
Commitment to school	3.32	.72	1.00	5.00	4031
Boys	3.24*	.76	1.00	5.00	1876
Girls	3.40	.68	1.00	5.00	2031
Social competence	3.06	.67	1.00	4.00	3456
Boys	2.98*	.66	1.00	4.00	1550
Girls	3.13	.67	1.00	4.00	1801
Self-worth	3.01	.73	1.00	4.00	3463
Boys	3.07*	.67	1.00	4.00	1550
Girls	2.97	.77	1.00	4.00	1807
Mastery	3.12	.58	1.00	4.00	3680
Boys	3.15	.58	1.00	4.00	1687
Girls	3.10	.57	1.00	4.00	1873
Overall competence	.02	.67	-2.63	1.48	3465
Boys	-.02*	.66	-2.41	1.48	1559
Girls	.07	.67	-2.63	1.48	1806
Substance use	.00	.74	-.35	6.42	4038
Boys	.03*	.83	-.35	6.42	1881
Girls	-.06	.54	-.33	6.42	2030
Problem behaviors	.00	.78	-.29	6.33	4027
Boys		.93	-.29	6.33	1869
Girls	.09*	.50	-.27	6.33	2030
	-.10				
Overall problem behaviors	.00	.71	-.31	6.38	4005
Boys	.06*	.82	-.31	6.38	1856
Girls	-.08	.49	-.30	6.38	2023

* The difference between means for boys and girls is statistically significant, $p < .01$.

Correlations among the adolescent outcome variables and the six parenting dimensions plus monitoring are displayed in Table 6.11. All of the correlations for boys and girls combined were significantly different from zero and in the expected directions. However, there were some variations in the strengths of the relationships for boys and girls. Structure had a stronger relationship to positive outcomes for girls than for boys, and chaos had a stronger negative relationship with positive outcomes for girls than for boys. In general, there was less difference between boys and girls in the magnitude of the relationship between parenting variables and both substance use and problem behaviors. Given the overall similarities in the direction of the relationships, the discussion which follows is based on correlations for the total sample.

As hypothesized, parental warmth was positively correlated with academic competence, commitment to school, social competence, mastery, and self-worth. Parental warmth was also moderately correlated with the measure of overall competence. Although weaker negative correlations were expected between parental warmth and adolescent substance use and between parental warmth and adolescent problem behaviors, the magnitude of the relationship between parental warmth and substance use and problem behaviors were similar to the magnitude for positive adolescent outcomes. The correlations between warmth and substance use and problem behaviors were stronger than the correlations between substance use and problem behaviors and other parenting dimensions except monitoring.

Table 6.11

Correlations Among Adolescent Outcomes and Parenting Dimensions by Gender

Adolescent Outcomes	Warmth	Structure	Autonomy Support	Rejection	Chaos	Coercion	Monitoring
Academic Competence	.27	.24	.31	-.31	-.32	-.20	.22
Boys	.25	.18	.26	-.27	-.25	-.18	.18
Girls	.28	.30	.34	-.34	-.34	-.22	.25
Commitment to School	.34	.34	.34	-.24	-.21	-.14	.32
Boys	.32	.30	.30	-.19	-.16	-.14	.30
Girls	.34	.40	.37	-.29	-.26	-.17	.34
Social Competence	.22	.19	.26	-.27	-.21	-.17	.12
Boys	.24	.19	.29	-.29	-.19	-.18	.09
Girls	.18	.17	.22	-.24	-.23	-.16	.12
Mastery	.40	.38	.47	-.50	-.41	-.38	.27
Boys	.35	.31	.43	-.48	-.34		.23
Girls	.44	.43	.50	-.51	-.48	-.33	.32
						-.42	
Self-Worth	.35	.33	.41	-.42	-.33	-.31	.23
Boys	.33	.27	.38	-.39	-.26	-.27	.19
Girls	.37	.37	.44	-.44	-.38	-.33	.27
Overall Competence	.44	.41	.50	-.49	-.42	-.34	.33
Boys	.42	.35	.46	-.45	-.34		.28
Girls	.44	.46	.52	-.51	-.49	-.31	.36
						-.37	
Substance Use	-.30	-.24	-.25	.24	.11	.06	-.31
Boys	-.31	-.23	-.25	.24	.08		-.33
Girls	-.26	-.26	-.26	.22	.14	.03(ns)	-.30
						.09	
Problem Behaviors	-.29	-.23	-.24	.22	.09	.05	-.28
Boys	-.31	-.24	-.24	.23	.09		-.29
Girls	-.25	-.22	-.24	.21	.10	.04(ns)	-.27
						.08	
Overall Problem Behaviors	-.31	-.24	-.26	.24	.11	.06	-.31
Boys	-.32	-.24	-.26	.24	.09		-.32
Girls	-.27	-.25	-.27	.23	.13	.04(ns)	-.30
						.09	

Note: All correlations are significant, $p < .01$ except as indicated by (ns).

As expected, structure was positively associated with academic competence, commitment to school, mastery, and self-worth, and negatively associated with substance use and problem behaviors. Although a significant relationship between structure and social competence was not expected this correlation was significant as well; however, the magnitude was relatively small, $r = .19, p < .01$.

Autonomy support was positively correlated with all of the positive adolescent outcomes and negatively correlated with substance use and problem behaviors. The correlations between autonomy support and all of the positive adolescent outcomes were moderate to fairly strong ranging from .26 with social competence to .47 with mastery. The correlation between autonomy support and the overall competence measure was .50. The correlations between autonomy support and substance use and problem behaviors were -.24 and -.25 respectively.

As expected, parental rejection was negatively correlated with positive adolescent outcomes and positively correlated with substance use and problem behaviors. The negative correlations of mastery, self-worth, and social competence with parental rejection were stronger than their correlations with other adolescent outcomes. The correlation between rejection and overall competence was also fairly strong, -.49.

Parental chaos was negatively correlated with academic competence, commitment to school, social competence, mastery, self-worth, and overall competence. Although the correlation between chaos and substance use and problem behaviors were significant, they were fairly low, .11 and .09 respectively.

As hypothesized, coercion was negatively correlated with academic competence, commitment to school and mastery, and positively correlated with adolescent substance use and problem behaviors. While these correlations were in the expected directions, some of the correlations were small. The correlation of coercion and commitment to school was relatively weak, $r = -.14$, and the correlations between coercion and substance use and coercion and problem behaviors were very small, .06 and .05 respectively. Although not expected, there was a small but significant correlation between coercion and social competence, $r = -.17$.

The correlations between monitoring and adolescent outcomes also appear in Table 6.11. Like the other positive parenting dimensions parental monitoring was positively correlated with positive adolescent outcomes and negatively associated with substance use and problem behaviors. Monitoring had its strongest correlations with commitment to school ($r = .32$), overall competence ($r = .33$), substance use ($r = -.31$), and overall problem behaviors ($r = -.31$).

Tests for Interactions. Based on findings that indicated differences for girls versus boys in the relationship between parenting dimensions and adolescent outcomes (Barber & Olsen, 1997; Eccles et al., 1997; Werner & Silbereisen, 2003), the planned analyses included exploring the data for possible interactions between parenting dimensions and gender. After testing for gender interactions, some unexpected signs continued to be observed on some parenting dimension regression coefficients. This led to the testing of additional interactions among parenting dimensions. Four interactions seemed plausible; warmth by coercion, structure by coercion, monitoring by coercion,

and autonomy support by chaos. It was hypothesized that among adolescents whose parents were perceived as high on coercion, high levels of parental warmth, structure and monitoring might be perceived as intrusive and lead to poorer outcomes. It was also hypothesized that when chaos was high, autonomy support may be experienced as chaos and lead to poorer adolescent outcomes.

Centered parenting dimension scores were used in the tests for interactions. Parenting dimensions were centered by subtracting the sample mean for each parenting dimension from participants' scores on that parenting dimension. For example, the sample mean for warmth was subtracted from each participants warmth measure to create a new centered warmth variable. Centered parenting dimension scores and gender (coded 0=male, 1=female) were multiplied to calculate the parenting dimension by gender interactions. Interaction terms for selected parenting dimensions were calculated through multiplication of the centered parenting dimensions (e.g., centered autonomy support x centered chaos).

Gender by parenting dimension interactions. Interactions were tested in two-step hierarchical regressions models. The parenting dimensions (centered) and gender were entered in the first step, and the interaction of interest was entered at the second step. In total, seven interaction terms were tested in models predicting nine adolescent outcomes. Since 63 regression models were created, the potential for identifying significant interactions by chance was high. To reduce the potential for incorrectly specifying an interaction as significant, alpha was set at .01. Using $p \leq .01$ as the criteria for significance, 20 significant interactions were identified. Although a substantial

number of interactions were identified as statistically significant, the additional variance explained by the interactions was small.

For illustration of the procedure, the regression model for testing the interaction of chaos and gender is displayed in Table 6.12. The centered parenting dimensions (warmth, structure, autonomy support, rejection, chaos, and coercion) and gender were entered at step 1, followed by the interaction of centered chaos and gender at step 2. The parenting dimensions explained 14.3% of the variance in academic competence. The chaos by gender interaction explained an additional .2% of the variance in academic competence. Although statistically significant ($p < .01$), the amount of additional variance explained by the chaos by gender interaction was extremely small. Table 6.13 displays the regression coefficients (b), standardized regression coefficients (β), test statistics (t),

Table 6.12

Hierarchical Regression Predicting Academic Competence from Parenting

Dimensions, Gender, and the Interaction of Chaos and Gender

Step/Variables	R^2	Adjusted R^2	F	R^2	F Change
				Change	
1. Parenting Dimensions	.143	.141	77.9*		
and Gender					
2. Chaos x Gender	.145	.142	69.2*	.002	6.932*

* $p < .01$

Note: Parenting Dimensions were centered.

Table 6.13

Regression Coefficients Predicting Academic Competence from
Parenting Dimensions, Gender, and Chaos x Gender Interaction

Variable	<i>B</i>	Beta	<i>t</i>	<i>p</i> ≤
Warmth	.07	.03	1.06	.29
Structure	.00	.00	-.07	.95
Autonomy Support	.33	.14	5.05	.01
Rejection	-.21	-.08	-3.25	.01
Chaos	-.37	-.15	-5.41	.01
Coercion	.03	.01	.63	.53
Gender	.67	.20	3.72	.01
Chaos x Gender	-.21	-.15	-.263	.01
(Constant)	-.29			

Note: Parenting dimensions were centered.

and *p*-values for the parenting dimensions, gender and chaos by gender interaction when used to predict academic competence. Parental autonomy support, rejection, chaos, and gender were significant predictors of academic competence. The significant interaction of chaos and gender indicates that high parental chaos is more detrimental for girls than for boys. The standardized regression coefficient for girls is -.58 compared with -.37 for boys.

Regression coefficients, *p*-values, and the proportion of variance explained ($R^2\Delta$) for each of the parenting dimension by gender interactions tested are displayed in

Table 6.14. As noted earlier, the amount of variance explained by the addition of these interaction terms was small. Of the 20 statistically significant interactions, only one explained as much as one percent of the variance in the associated outcome variable. Since the purpose of these tests was to identify the interactions to be included in more detailed regression models, particular interactions are not discussed in this section.

Selected Interactions between Parenting Dimensions. Tests of warmth x coercion, structure by coercion, monitoring by coercion, and autonomy support by chaos interactions were conducted using multiple hierarchical regression in a procedure similar to that described for parenting dimension by gender interactions. Separate regression models were run to test each interaction using centered parenting dimensions. Regression coefficients, p -values, and variance explained by each of the interaction terms are displayed in Table 6.15. Again, the potential for testwise error is high given the number of analyses conducted. Of 36 additional interaction terms tested, 28 were significant at the $p < .01$ level of confidence. Only four of the interactions explained one percent or more of the variance in the associated outcome variable. Specific interactions will be discussed in the section that follows.

Table 6.14

Tests for Parenting Dimension by Gender Interactions

Interaction	Academic Competence			Social Competence			Self-Worth			Mastery			Commitment to School		
	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ
Warmth x Gender	-.05	.51	.000	-.10	.00	.002	.02	.51	.000	.01	.56	.000	-.02	.59	.000
Structure x Gender	.15	.06	.001	-.06	.06	.001	.08	.02	.001	.02	.31	.000	.06	.06	.001
Autonomy Support x Gender	.09	.23	.000	-.09	.00	.002	.06	.05	.001	.01	.78	.000	.03	.38	.000
Rejection x Gender	-.09	.25	.000	.07	.04	.001	-.07	.03	.001	.01	.65	.000	-.01	.66	.000
Chaos x Gender	-.21	.01	.002	-.02	.58	.000	-.13	.00	.004	-.09	.00	.003	-.01	.64	.000
Coercion x Gender	-.01	.95	.000	.05	.10	.001	-.05	.15	.000	-.03	.26	.000	.05	.14	.001
Monitoring x Gender	.11	.24	.000	-.01	.82	.000	.10	.01	.001	.05	.10	.001	.03	.47	.000

Note: Parenting dimensions were centered. Significant interaction coefficients are shaded.

(Table continues)

Table 6.14 Continued

Tests for Parenting Dimension by Gender Interactions

	Overall Competence			Substance Use			Problem Behavior			Overall Problem Behavior		
Interaction	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ
Warmth x Gender	-.04	.15	.000	.14	.01	.005	.22	.01	.010	.18	.01	.008
Structure x Gender	.04	.16	.000	.04	.16	.000	.11	.01	.003	.07	.02	.001
Autonomy Support x Gender	.01	.78	.000	.08	.01	.002	.13	.01	.004	.10	.01	.003
Rejection x Gender	-.02	.58	.000	.13	.01	.005	.17	.01	.006	.14	.01	.006
Chaos x Gender	-.10	.01	.003	-.04	.23	.000	-.09	.01	.002	-.06	.03	.001
Coercion x Gender	.00	.93	.000	-.01	.69	.000	-.04	.19	.000	-.02	.40	.000
Monitoring x Gender	.06	.09	.000	.13	.01	.003	.17	.01	.005	.15	.01	.014

Note: Parenting dimensions were centered. Significant interaction coefficients are shaded.

Table 6.15
Tests for Interactions between Selected Parenting Dimensions

Interaction	Academic Competence			Social Competence			Self-Worth			Mastery			Commitment to School		
	<i>b</i>	<i>p</i>	R ² Δ	<i>b</i>	<i>p</i>	R ² Δ	<i>b</i>	<i>p</i>	R ² Δ	<i>b</i>	<i>p</i>	R ² Δ	<i>b</i>	<i>p</i>	R ² Δ
Warmth x Coercion	-.25	.01	.007	-.08	.01	.004	-.06	.01	.002	-.02	.05	.001	-.06	.01	.002
Structure x Coercion	-.29	.01	.010	-.08	.01	.005	-.06	.01	.002	-.04	.01	.002	-.04	.02	.001
Autonomy Support x Chaos	-.28	.01	.008	-.07	.01	.003	-.09	.01	.005	-.06	.01	.003	-.08	.01	.004
Monitoring x Coercion	-.18	.01	.002	-.01	.71	.000	-.05	.05	.001	-.04	.01	.002	-.05	.04	.001

Interaction	Overall Competence			Substance Use			Problem Behavior			Overall Problem Behavior		
	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ	<i>b</i>	<i>p</i> ≤	R ² Δ
Warmth x Coercion	-.10	.01	.007	.12	.01	.009	.13	.01	.010	.12	.01	.010
Structure x Coercion	-.11	.01	.009	.09	.01	.006	.10	.01	.007	.10	.01	.007
Autonomy Support x Chaos	-.13	.01	.012	.03	.13	.000	.05	.02	.001	.04	.05	.001
Monitoring x Coercion	-.07	.01	.002	.08	.01	.003	.10	.01	.004	.08	.01	.004

Note: Parenting dimensions were centered. Significant interaction coefficients are shaded.

Full Regression Models

The previous section presented results from separate hierarchical regressions conducted to identify significant interactions between parenting dimensions and gender and between selected parenting dimensions. This section reports findings from a series of hierarchical regression models that analyzed combinations of interactions. Three steps were included in hierarchical regression models to predict each adolescent outcome. The first two steps were identical for all of the outcome variables, while the third step varied depending on which interactions were previously identified as significant in the simpler models. In the first step, demographic variables including gender, grade, race (coded as white=0 and non-white=1), and family type (coded as lives with both parents=0 and lives with other adults=1). Centered parenting dimensions were entered at step 2. At step 3, the interaction terms that were identified as significant in the separate regression runs were entered.

Five interaction terms—chaos x gender, warmth x coercion, structure x coercion, monitoring x coercion, and autonomy support x chaos—that were significant predictors of academic competence (see Tables 6.14 and 6.15) were entered at step 3 of the regression model to predict academic competence. When included in combination, not all of the interactions were statistically significant. In an attempt to simplify interpretation of results, the nonsignificant interactions were removed from the regression model and the model re-estimated. Removal of the nonsignificant interactions was accomplished in a series of steps removing one interaction at a time so

that no significant predictors would be lost. The same process was repeated to estimate the regression models predicting each of the adolescent outcomes.

Results for regression models predicting positive adolescent outcomes are presented in Tables 6.16 and 6.17. Overall, the models explained from 10.0% to 33.9% of the variance in the adolescent outcome variables. For all of the models, a significant ($p \leq .01$) portion of variance was explained at each step in the model. Demographic control variables explained from 1.3% to 4.6% of the variance in adolescent outcomes. Parenting dimensions as a set explained from 8.1% of the variance in social competence to 32.7% of the variance in overall competence. The sets of interactions explained only about 1% of the variance in each of the adolescent outcomes.

Autonomy support and chaos were important predictors of positive adolescent outcomes across all of the models. The effects of autonomy support depended on the level of chaos and, for some outcomes, on gender. There was a significant interaction between autonomy support and chaos in every model (i.e., for every positive outcome). In addition, autonomy support interacted with gender in predicting social competence and chaos interacted with gender in predicting self-worth, mastery, and overall competence. The consistent pattern of interactions between autonomy support and chaos suggests that despite the small amount of variance explained and the large number of tests conducted, the interactions are not likely the result of chance.

The effects of the significant interactions were evaluated for each of the adolescent outcomes (see Appendix G, Figures G1-G20). When there was a significant

Table 6.16

Full Regression Models for Positive Adolescent Outcomes: Variance Explained

	Academic Competence			Social Competence			Self-Worth			Mastery			Commitment to School			Overall Competence		
Step	R ²	R ² Δ	p≤	R ²	R ² Δ	p≤	R ²	R ² Δ	p≤	R ²	R ² Δ	p≤	R ²	R ² Δ	p≤	R ²	R ² Δ	p≤
1. Control Variables	.046		.01	.013		.01	.017		.01	.031		.01	.022		.01	.033		.01
2. Parent Dimensions	.163	.117	.01	.094	.081	.01	.231	.214	.01	.318	.287	.01	.173	.152	.01	.327	.294	.01
3. Interactions	.168	.006	.01	.100	.006	.01	.241	.010	.01	.324	.006	.01	.176	.003	.01	.339	.012	.01

Table 6.17
Full Regression Models for Positive Adolescent Outcomes: Regression Coefficients

	Academic Competence			Social Competence			Self-Worth			Mastery			Commitment to School			Overall Competence		
Step 3	<i>b</i>	β	<i>p</i> ≤	<i>b</i>	β	<i>p</i> ≤	<i>b</i>	β	<i>p</i> ≤	<i>b</i>	β	<i>p</i> ≤	<i>b</i>	β	<i>p</i> ≤	<i>b</i>	β	<i>p</i> ≤
<u>Control Variables</u>																		
Gender	.17	.05	.01	.13	.10	.01	-.14	-.10	.01	-.08	-.07	.01	.11	.08	.01	.03	.02	.11
Grade	.03	.02	.18	.00	.00	.91	.00	.01	.67	.02	.04	.01	-.03	-.05	.01	.00	.00	.76
Race	-.27	-.07	.01	.01	.00	.74	-.04	-.02	.14	-.08	-.05	.01	.08	.05	.01	-.06	-.04	.01
Family Type	-.32	-.10	.01	.02	.02	.33	.01	.01	.73	-.02	-.02	.24	-.01	-.01	.67	-.05	-.04	.01
<u>Parent Dimensions</u>																		
Warmth	.01	.01	.86	-.00	.00	.80	-.01	-.01	.75	-.01	-.02	.51	.05	.05	.06	.01	.01	.66
Structure	-.07	-.03	.28	-.01	-.01	.81	.01	.01	.72	.02	.03	.20	.10	.09	.01	.01	.01	.57
Autonomy	.34	.15	.01	.17	.18	.01	.19	.19	.01	.14	.18	.01	.14	.14	.01	.21	.22	.01
Support	-.26	-.11	.01	-.17	-.17	.01	-.24	-.23	.01	-.21	-.26	.01	-.01	-.01	.61	-.20	-.21	.01
Rejection	-.40	-.16	.01	-.06	-.06	.01	.02	.02	.52	-.03	-.04	.13	-.03	-.03	.16	-.08	-.08	.01
Chaos	.00	.00	.93	-.01	-.01	.78	-.09	-.08	.01	-.09	-.11	.01	-.03	-.03	.18	-.05	-.06	.01
Coercion	.20	.07	.01	-.01	-.01	.54	.08	.06	.01	.07	.07	.01	.20	.17	.01	.11	.10	.01
Monitoring																		
<u>Interactions</u>																		
Autonomy				-.09	-.07	.01												
Support							-.13	-.09	.01	-.08	-.07	.01				-.08	-.06	.01
x Gender																		
Chaos x Gender	-.24	-.08	.01	-.07	-.06	.01	-.11	-.08	.01	-.06	-.06	.01	-.07	-.06	.01	-.13	-.11	.01
Autonomy																		
Support	-.16		.46	2.95		.01	3.03		.01	3.00		.01	3.54		.01	-.01		.85
x Chaos																		
Constant																		

Note: Parent dimensions and interaction terms were centered.

gender interaction, the autonomy support by chaos interaction was examined for boys and girls separately. (There were no significant 3-way interactions.) Interactions were evaluated by holding other variables (except gender) constant at their means and allowing the interacting variables to take on values of +1 and -1 standard deviations from their means. The findings indicated that autonomy support was generally associated with better outcomes when parental chaos was low. However, when chaos was high, there was little or no change in adolescent outcomes as a function of levels of autonomy support.

Other significant predictors of positive adolescent outcomes were rejection and monitoring. Rejection had a significant negative association with all of the adolescent outcomes except commitment to school. Monitoring had a significant positive association with all of the outcomes except social competence.

Tables 6.18 and 6.19 display results of hierarchical regression models predicting adolescent substance use, problem behaviors, and overall problem behaviors. Three sets of variables were entered into the models. Demographic control variables were entered in the first step and explained 2% to 3% of the variance in substance use and problem behaviors. Parenting dimensions explained about 10% of the variance in substance use and problem behaviors, and interaction terms explained about 2% of the variance in each of the models.

Warmth, rejection, and monitoring were significant predictors of substance use and problem behaviors. In addition, because of its interactions with warmth, structure, and monitoring, coercion was also significantly associated with substance use and

Table 6.18

Full Regression Models for Substance Use and Problem Behaviors: Variance

Explained

Step	Substance Use			Problem Behaviors			Overall Problem Behavior		
	R^2	$R^2\Delta$	p	R^2	$R^2\Delta$	p	R^2	$R^2\Delta$	p
1. Control Variables	.020		.01	.031		.01	.028		.01
2. Parenting Dimensions	.131	.111	.01	.128	.097	.01	.145	.117	.01
3. Interactions	.153	.021	.01	.152	.024	.01	.170	.026	.01

Table 6.19

Full Regression Models for Substance Use and Problem Behaviors:
Regression Coefficients

	Substance Use			Problem Behaviors			Overall Problem Behavior		
Step 3	<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>	<i>b</i>	β	<i>p</i>
<u>Control Variables</u>									
Gender	.17	.12	.01	-.13	-.09	.01	-.07	-.05	.01
Grade	.01	.01	.39	-.00	-.01	.69	.00	.00	.86
Race	.10	.06	.01	.15	.09	.01	.13	.08	.01
Family Type	.04	.03	.05	.02	.02	.31	.03	.02	.14
<u>Parenting Dimensions</u>									
Warmth	-.01	-.01	.83	-.14	-.13	.01	-.10	-.10	.01
Structure	-.00	-.00	.92	.02	.03	.32	.02	.02	.38
Autonomy Support	-.04	-.05	.10	-.04	-.04	.12	-.04	-.05	.06
Rejection	.20	.20	.01	.13	.13	.01	.14	.15	.01
Chaos	-.05	-.05	.03	-.06	-.06	.01	-.05	-.06	.01
Coercion	-.02	-.02	.26	-.02	-.02	.40	-.02	-.02	.28
Monitoring	-.21	-.19	.01	-.19	-.16	.01	-.20	-.19	.01
<u>Interactions</u>									
Warmth x Gender				.20	.14	.01	.15	.11	.01
Rejection x Gender	-.12	-.16	.01						
Warmth x Coercion	.10	.09	.01				.07	.06	.01
Structure x Coercion	.14	.15	.01	.13	.13	.01	.13	.14	.01
Monitoring x Coercion				.11	.08	.01	.07	.05	.01
Constant	-.15		.07	-.01		.92	-.08		.35

Note: Parenting dimensions and interactions were centered.

problem behaviors. As expected, monitoring was negatively associated with substance use and problem behaviors, and rejection was positively associated with substance use and problem behaviors. The direction of the effects of other significant parenting dimension regression coefficients need to be interpreted in light of their interactions. Due to the large number of tests for interactions that were conducted and the small effect sizes, any conclusions based on these findings should be considered tentative.

Rejection significantly interacted with gender in predicting substance use. The regression coefficient for girls was .08 and for boys .20 indicating that although substance use increases with higher levels of parental rejection for both girls and boys, the increase is greater for boys than for girls (Figure G11).

There were also significant warmth by coercion and structure by coercion interactions in predicting substance use. For both of these interactions, when coercion was low, an increase in warmth or an increase in structure was associated with lower levels of substance use (Figures G12 and G13). However, when coercion was high, an increase in warmth had little affect on substance use. When coercion was high, an increase in structure was associated with higher levels of substance use.

There were significant warmth by gender, structure by coercion, and monitoring by coercion interactions in predicting problem behaviors. An increase in parental warmth was associated with lower levels of problem behaviors for boys, but with higher levels of problem behaviors for girls (Figure G14). When coercion is low, increases in structure and in monitoring are associated with fewer problem behaviors (Figures G15 and G16). When coercion is high, higher structure is associated with more problem

behaviors, while an increase in monitoring is associated with slightly fewer problem behaviors.

There were four significant interactions in predicting overall problem behaviors: warmth by gender, warmth by coercion, structure by coercion, and monitoring by coercion. Warmth by gender and warmth by coercion were evaluated together. When perceived parental coercion is low, higher levels of warmth are associated with fewer overall problem behaviors for both girls and boys. However, the effect is greater for boys than for girls. When coercion is high, high levels of warmth are associated with increased overall problem behavior for girls. For boys, however, there is no change in overall problem behaviors at higher levels of warmth when coercion is high (Figures G17 and G18). The significant interaction of structure with coercion indicates that when coercion is low, higher structure is associated with fewer overall problem behaviors. However, when coercion is high, higher structure is associated with higher overall problem behaviors (Figure G19). The monitoring by coercion interaction indicates that increases in monitoring result in fewer overall problem behaviors at both low and high levels of monitoring, but the decline in overall problems behaviors is larger when coercion is low (Figure G20).

Given the complexity of the relationships among parenting dimensions and adolescent outcomes and behaviors, a summary of the general effects for each parenting dimension follows.

Warmth. Contrary to expectations, parental warmth was not significantly related to positive adolescent outcomes after controlling for demographics and other parenting

dimensions. Parental warmth was, however, a significant predictor of substance use and problem behaviors for some groups of adolescents as indicated by the significant interactions of warmth and coercion in predicting substance use and overall problem behaviors and of warmth and gender in predicting problem behaviors and overall problem behaviors. The warmth and coercion interaction in predicting substance use was such that when coercion was low, higher levels of parental warmth were associated with lower substance use and overall problem behaviors. In contrast, when parental coercion was high, high warmth was associated with higher substance use for both boys and girls and with higher overall problem behaviors for girls. The gender by warmth interaction in predicting problem behaviors indicated that, an increase in parental warmth was associated with lower problem behaviors for boys. For girls, however, an increase in parental warmth was associated with a small increase in problem behaviors.

Structure. Although expected to have a positive relationship with academic competence, self-worth, and mastery, after controlling for demographics and other parenting dimensions, structure was a significant predictor of only commitment to school. The relationship of structure with substance use and problem behaviors depended on the level of parental coercion. When parental coercion was low, an increase in structure was associated with lower levels of substance use and problem behaviors. When coercion was high, an increase in structure was associated with higher levels of substance use and problem behaviors.

Autonomy Support. After controlling for demographics and other dimensions of parenting, autonomy support was a strong predictor of positive adolescent outcomes.

However, the relationship between autonomy support and positive adolescent outcomes depended on the level of perceived parental chaos. When chaos was low, high levels of autonomy support were consistently related to high levels of all positive adolescent outcomes. When chaos was high, higher levels of autonomy support had much less or no effect on positive adolescent outcomes.

Autonomy support was not a strong predictor of substance use or problem behaviors when included in hierarchical regression models with demographics and other parenting dimensions.

Rejection. After controlling for demographics and other parenting dimensions, rejection showed a strong negative association with academic competence, social competence, self-worth, mastery and overall competence. Rejection was also positively associated with substance use and problem behaviors. Higher levels of rejection tend to be associated with greater increases in substance use for boys than for girls.

Chaos. The interactions between autonomy support and chaos were interpreted earlier by holding chaos constant at low and then at high levels. Alternatively, the interactions are interpreted here holding autonomy support constant at low and then high levels. When autonomy support was high, high levels of parental chaos were consistently related to lower levels of all positive academic outcomes for both boys and girls. However, when autonomy support was low, the effects on positive adolescent outcomes were mixed. When autonomy support was low, an increase in chaos was associated with lower academic competence, but with higher commitment to school. When autonomy support was low, an increase in chaos was associated with small

increases in social competence and self-worth for both boys and girls. In contrast, when autonomy support was high, an increase in chaos was associated with a slight decline in mastery for girls, and an increase in mastery for boys.

Higher levels of perceived parental chaos did not have a significant effect on adolescent substance use, but were associated with slightly lower levels of problem behaviors. Overall problem behaviors, the combined measure of substance use and problem behaviors, also declined slightly, but significantly, with higher levels of parental chaos.

Coercion. Adolescents' perceptions of parental coercion were not significantly related to adolescents' academic competence, social competence, or commitment to school. Perceptions of parental coercion were, however, significantly related to adolescents' self-worth, mastery, and overall competence. In general, higher levels of perceived parental coercion were associated with lower self-worth, mastery, and overall competence.

The relationships between parental coercion and adolescent substance use and between coercion and problem behaviors were somewhat more complex. Perceptions of parental coercion interacted with warmth in predicting substance use and with structure in predicting substance use and problem behaviors. Perceptions of parental coercion also interacted with monitoring in predicting problem behaviors.

In all four cases, the interaction of coercion with the positive parenting dimension, whether it was coercion with warmth in predicting substance use, coercion with structure in predicting substance use and problem behaviors, or coercion with

monitoring in predicting problem behaviors, when the positive parenting dimension was low, higher levels of perceived parental coercion were associated with lower substance use and problem behaviors. However, when the adolescent perceived high levels of the positive parenting dimension, higher parental coercion was associated with more substance use or problem behaviors.

Monitoring. It was expected that monitoring items would combine with structure items to form a combined parenting dimension. However, structure and monitoring formed two separate dimensions. In examining the relationships between parental monitoring and adolescent outcomes and structure and adolescent outcomes, monitoring emerged as more closely fitting the hypothesized relationships between structure and adolescent outcomes. When combined with demographic characteristics and other parenting dimensions to predict adolescent outcomes, monitoring was positively related to academic competence, self-worth, mastery, and commitment to school, and negatively related to substance use and problem behaviors. These are the relationships that were expected to exist between structure and adolescent outcomes.

Monitoring also interacted with coercion in predicting problem behaviors. When coercion was high, higher levels of monitoring were associated with only slightly lower levels of problem behaviors. However, when coercion was low, higher levels of monitoring were associated with substantially lower levels of problem behaviors.

Summary Measurement of Parenting Dimensions

The two questions addressed in this chapter were (a) whether three or six parenting dimensions underlie parenting style, and (b) how parenting dimensions are

related to adolescent outcomes. Before the three- or six- dimension question could be addressed, a set of 48 parenting items developed to capture children's perceptions of parenting in each of six dimensions (warmth, rejection, structure, chaos, autonomy support, and coercion) was reduced and refined. Using a combination of confirmatory and exploratory factor analyses it was determined that the six dimensions could be represented by a set of 24 items.

To test whether a three- or six-dimension model better described adolescent's perceptions of parenting, the six-dimension parenting model was compared to a three-dimension parenting model that combined warmth and rejection, structure and chaos, and autonomy support and coercion into three dimensions. Confirmatory factor analyses indicated that the six-dimension model fit the data better than a three-dimension model. Higher correlations among the set of positive parenting dimensions and the set of negative parenting dimensions as opposed to between structure and chaos and autonomy support and coercion lend further support to the existence of six parenting dimensions rather than three bipolar dimensions. Despite the high inter-dimension correlations, exploratory factor analyses indicated simple structure among both the positive parenting dimensions and the negative parenting dimensions.

An unanticipated finding of the exploratory factor analyses was that monitoring items, which were expected to load with structure items, formed a separate factor. Given the important role of monitoring in the literature addressing adolescent substance use and problem behaviors, monitoring was included with warmth, structure, autonomy support, rejection, chaos, and coercion in many subsequent analyses.

Based on zero-order correlations, all of the relationships among the parenting dimensions and adolescent outcomes and behaviors were significant ($p < .01$) and in the expected directions. Further exploration of the relationships using hierarchical multiple regressions revealed several interesting patterns. Autonomy support, rejection, chaos, and monitoring emerged as most strongly associated with positive adolescent outcomes when all of the parenting dimensions were included in hierarchical regression models. In addition, there were consistent interactions of autonomy support and chaos across all of the models predicting positive outcomes. When parental chaos was low, higher levels of autonomy support were associated with higher academic competence, commitment to school, social competence, self-worth, mastery, and overall competence. When parental chaos was high, higher autonomy support was associated with little or no change in positive outcomes. Although the effects were small, the detrimental effects of chaos appeared to be greater for girls than for boys. As expected, higher levels of parental rejection were associated with poorer adolescent outcomes. Higher levels of monitoring were generally associated with better adolescent outcomes.

Warmth, rejection, coercion, and monitoring were the parenting dimensions most strongly associated with adolescent substance use and problem behaviors. However, the relationships among the parenting dimensions and substance use and problem behaviors tended to be more complex than the relationships between parenting dimensions and positive adolescent outcomes. In general, warmth, structure, and monitoring were associated with lower levels of overall problem behaviors. Exceptions occurred when coercion was high. High levels of warmth and monitoring were

associated with more overall problem behaviors when coercion was high. Some effects also varied by gender with boys showing greater increases in substance use than girls when rejection was high and girls showing greater increases in problem behaviors when warmth and coercion were high.

Chapter 7

Parenting Types and Adolescent Outcomes

This chapter explores (a) whether clusters or groups of adolescents identified based on their parenting dimension scores form distinct groups that can be used to represent parent types, and (b) whether particular parent types as represented by the clusters are associated with different patterns of adolescent outcomes. Specifically, the hypothesis being tested is:

(H2) Groups of adolescents with varying combinations of perceived parental scores on parenting dimensions will have different patterns of adolescent outcomes.

Identifying Parent Types

K-means cluster analysis was used to classify adolescents into groups based on parenting scores. This procedure identifies clusters or groups of respondents with similar patterns of responses on a set of questions (Hartigan, 1975). In this analysis, scores on the parenting dimensions – warmth, structure, autonomy support, monitoring, rejection, chaos, and coercion – were used to classify adolescent respondents into seven clusters. K-means cluster analysis requires the researcher to specify the number of clusters to include in the analysis. Solutions with five, six, and seven clusters were examined. Based on interpretability of the clusters, the solution including seven clusters was kept.

The seven clusters resulting from this analysis and their means and standard deviations of scores on each of the parenting dimensions appear in Table 7.1. A one-way multivariate analysis of variance (MANOVA) was conducted to test for differences on the parenting dimensions across the seven clusters and to determine how much of the variance in the set of parenting dimensions was represented by the clusters. Significant differences were found among the clusters, Wilks' Lambda = .03, $F_{42,17668} = 464.77$, $p < .001$. Multivariate η^2 was strong (.44), indicating that 44% of the variance in the set of parenting dimensions was represented by the clusters.

Analyses of variance (ANOVA) were conducted on each of the parenting dimensions as follow-up tests. All of the ANOVAs were significant (Table 7.2). Bonferroni post hoc tests were used to test for differences among the clusters on each of the parenting dimensions. A significance level of .001 was used to reduce the potential for Type I errors. Due to the number of significant differences among the means, differences that were **not** significantly different are noted on Table 7.1. All of the parent types showed statistically significant differences from other parent types on the majority of parenting dimensions. The clusters have been labeled on Table 7.1 to correspond to the patterns of high, moderate, and low scores on the parenting dimensions. Although the clusters actually represent groups of adolescents with similar perceptions of their parents, the clusters are referred to as parent types for ease of discussion.

Cluster 1 (Figure 7.1) included adolescents who gave their parents high ratings on positive parenting dimensions (warmth, structure, autonomy support, and monitoring) and low ratings on negative parenting dimensions (rejection, chaos, and

Table 7.1
Cluster Means and Standard Deviations

Parenting Dimension (N)	1 Authoritative (867)	2 Warm Authoritarian (699)	3 Permissive (736)	Cluster 4 Authoritarian (509)	5 Mediocre (602)	6 Rejecting (291)	7 Indifferent (75)	Total (3779)
Warmth								
Mean	3.94	3.77	3.69	3.19	3.07	2.10	1.59	3.42
Standard Deviation	.15	.28	.33	.44	.43	.60	.62	.69
Structure								
Mean	3.70	3.29	3.02	2.89	2.51	1.89	1.52	3.00
Standard Deviation	.29	.42	.40	.50	.44	.55	.51	.70
Autonomy Support								
Mean	3.86	3.43	3.54	2.76 ^a	2.80 ^a	1.84 ^b	1.85 ^b	3.20
Standard Deviation	.22	.41	.35	.53	.45	.53	.79	.73
Monitoring								
Mean	3.84	3.74	3.43	3.53	3.05	2.87 ^c	1.90 ^c	3.45
Standard Deviation	.27	.31	.50	.44	.56	.75	.85	.61
Rejection								
Mean	1.08	1.37	1.21	2.42	1.76 ^d	2.97	1.82 ^d	1.61
Standard Deviation	.22	.37	.29	.51	.44	.56	.67	.71
Chaos								
Mean	1.40	2.16	2.03	2.86	2.37	3.00	1.73	2.15
Standard Deviation	.37	.51	.47	.49	.48	.55	.62	.70
Coercion								
Mean	1.78 ^e	2.85	1.94	3.14	2.36	3.26	1.59 ^e	2.39
Standard Deviation	.46	.40	.36	.45	.46	.54	.57	.71

Note: Letters indicate pairs of means within rows that are **not** significantly different, $p > .001$.

Table 7.2

Univariate ANOVAs for Parenting Dimensions

Parenting Dimension	<i>F</i>	<i>df</i>	<i>p</i> <	η^2
Warmth	1557.28	6, 3772	.001	.71
Structure	1107.91	6, 3772	.001	.64
Autonomy Support	1334.76	6, 3772	.001	.68
Monitoring	435.05	6, 3772	.001	.41
Rejection	1422.82	6, 3772	.001	.69
Chaos	756.27	6, 3772	.001	.55
Coercion	1016.67	6, 3772	.001	.62

coercion). Due to the similarity of these parents to Baumrind's (1971, 1991) *authoritative* parent type, this cluster has been labeled **Authoritative**.

Cluster 2 (Figure 7.2) included adolescents who rated their parents moderately high on warmth, structure, autonomy support, and monitoring, and moderately low on rejection. The distinguishing feature of this group was that they rated their parents higher than average on coercion. This group has been labeled **Warm Authoritarian** since the parents were rated high on positive parenting dimensions and also higher than average on coercion which, along with punitive punishment, is a central theme in authoritarian parenting. The warm authoritarian parent type identified here is similar in some ways to Baumrind's (1991) *nonauthoritarian directive* type. Baumrind

characterized this parent type as loving and influential, but also restrictive and demanding of conformity. Although she distinguished them from her authoritarian classification, restrictiveness and demands for conformity are not inconsistent with the high scores on coercion which distinguish the warm authoritarian group found in the current study.

Cluster 3 (Figure 7.3) includes adolescents who gave their parents moderately high ratings (above the grand mean) on warmth and autonomy support and average ratings on structure and monitoring. They gave their parents low ratings on rejection, chaos and coercion. The average ratings on structure and monitoring relative to the higher ratings on warmth and autonomy support suggest that these parents show a more **Permissive** parenting type than do authoritative or warm authoritarian parents. Parents of adolescents in this group appear to be similar to Baumrind's early *permissive* type and later *democratic* parenting type, and to Maccoby and Martin's *indulgent* parent type.

Cluster 4 (Figure 7.4) includes adolescents who rated their parents below the overall means on warmth, structure, and autonomy support and second highest on coercion. This group's rating on coercion was higher than the rating for the Warm Authoritarian group, while its rating on warmth was substantially lower. Due to the high rating on coercion and lack of warmth, this group has been labeled **Authoritarian**. The description of this group coincides with Baumrind's *authoritarian directive* parenting style.

Cluster 5 (Figure 7.5) is characterized by its below average scores on positive parenting dimensions and near average scores on negative parenting dimensions.

These parents appear to be more engaged in their parenting roles than are rejecting and indifferent parents, but have lower scores on warmth, structure, and autonomy support than authoritative, warm authoritarian or permissive parents. This group has been labeled the **Mediocre** parent type. This group seems similar in some ways to Baumrind's *good enough* classification, but while her group scored about average on the parenting characteristics used in her research, the mediocre group scored below the grand means for warmth, structure, and autonomy support, and above the grand means for rejection, chaos, and coercion in the current study.

Cluster 6 (Figure 7.6) includes adolescents who rated their parents low on positive parenting dimensions and, as compared to other adolescents, gave their parents high ratings on rejection, chaos, and coercion. Since this group received the highest mean rating on rejection, it has been labeled the **Rejecting** parent type. A similar parent type has not been included in other parenting typologies.

Cluster 7 (Figure 7.7) is characterized by low scores on all of the parenting dimensions. This group does not perceive their parents as involved or as providing structure or autonomy support, nor are these parents perceived as particularly rejecting, chaotic, or coercive. They tend to be perceived as **Indifferent** across all parenting dimensions. Similar parent types are described by Baumrind as *unengaged* and by Maccoby and Martin as *neglectful*.

After identifying the parent types, profile analysis was used to determine whether the parent types that emerged from cluster analysis had different patterns of means on the parenting dimensions. Figure 7.8 displays the patterns of means on the parenting dimensions for each parent type. Profile analysis using a repeated measures multivariate analysis of variance (MANOVA) permits us to test three questions (Tabachnick and Fidell, 2001):

1. Parallelism – Do different parent types have parallel profiles across the parenting dimensions, or does the pattern depend on the parent type? The null hypothesis tested is that adjacent segments of the profile are parallel across all parent types. The clusters are considered to be more differentiated from each other if the profiles are *not* parallel.
2. Levels – Do the parent types score the same on the collective set of parenting dimensions, or are there differences in levels among the parent types? The null hypothesis tested is that there is no difference in the combined means on the parenting dimensions across all of the parent types. The clusters are considered to be more differentiated from each other if the levels are significantly different from each other.
3. Flatness of profile - Do all of the parenting dimensions elicit the same average response, or is there variation in mean parenting dimensions regardless of parent type? This is also a test of adjacent segments of the profiles with the null hypothesis being that when parent types are combined,

Figure 7.8
Profile of Parent Types

the slopes for the segments are equal to zero. The flatness test is unnecessary if the test for parallelism has been rejected since it will already be confirmed that at least one of the line segments is not flat.

Since the levels test examines differences in group means on the seven parenting dimensions, it was necessary to reverse the mean scores on the negative parenting dimensions (rejection, chaos, and coercion) so that higher scores across all of the parenting dimensions indicated more positive parenting. If the scores on rejection, chaos, and coercion were not reversed, the low scores on negative dimensions would detract from high scores on positive dimensions and vice versa. Figure 7.9 shows the means for the parenting dimensions with scores on rejection, chaos, and coercion reversed. As recoded, higher scores on negative parenting dimensions indicate less rejection, less chaos, and less coercion.

Profile analysis was performed using the seven parenting dimensions: warmth, structure, autonomy support, monitoring, rejection, chaos, and coercion as dependent variables. The grouping variable was parent type with seven groups: authoritative, warm authoritarian, permissive, authoritarian, mediocre, rejecting, and indifferent. SPSS repeated measures MANOVA was used to conduct the analysis. The test for parallelism indicated that the profiles of means deviated significantly from one another, Wilks' $\Lambda = .20$, $F_{36,16545} = 203.13$, $p < .001$, $\eta^2 = .24$. Rejection of the null hypothesis of parallelism indicates that the patterns of means depended on parent type. Since parallelism was rejected, flatness was also rejected, Wilks' $\Lambda = .48$, $F_{6,3767} = 678.48$, $p < .001$, $\eta^2 = .52$.

Figure 7.9
Profile of Parent Types
Reversed Scores on Rejection, Chaos, and Coercion

The test for levels indicated that in addition to the patterns of means being different there were also significant differences in the levels of the profiles, $F_{6,3772} = 4501.81, p < .001, \eta^2 = .88$. Post hoc followup tests were used to explore the differences in levels of the profiles. Bonferroni post hoc tests were used to test for differences among the parent types on their mean parenting dimension score (i.e., the overall mean across the parenting types). Bonferroni t-tests control for the overall error rate by setting the error rate for each test to the experiment-wise error rate divided by the total number of tests. Thus, the observed significance level is adjusted for the number of multiple comparisons made. All of the means were significantly different from one another, $p < .001$. Mean scores, standard errors, and 99.9% confidence intervals for each parent type are displayed in Table 7.3.

This set of analyses demonstrated that the parenting dimensions may be used through k-means cluster analysis to classify the respondents into seven clusters, each of which exhibits a different pattern of means on the parenting dimensions. Viewed across the parenting dimensions, the clusters have different mean levels of perceived positive parenting (Table 7.3). In addition, each of the clusters has some specific combination of attributes which supports the decision to classify each as a *type*.

Table 7.3

Mean Parenting Dimension Scores

Parent Type	Mean	Std. Error	99.9% Confidence Interval	
			Lower Bound	Upper Bound
Authoritative	3.73	0.006	3.71	3.75
Warm Authoritarian	3.26	0.007	3.24	3.29
Permissive	3.36	0.007	3.34	3.38
Authoritarian	2.71	0.008	2.68	2.73
Mediocre	2.85	0.007	2.82	2.87
Rejecting	2.07	0.011	2.03	2.10
Indifferent	2.39	0.021	2.32	2.46

Parenting Types and Adolescent Outcomes

Having established that groups of adolescents identified using cluster analysis differ in their perceptions of their parents, we turn next to addressing H2: Groups of adolescents with varying combinations of perceived parental scores on parenting dimensions will have different patterns of outcome variables. MANOVA was used to test for differences on the set of adolescent outcomes by parent type. Results indicated that parent type explained 8.6% of the variance in the set of adolescent outcomes, Wilks' Lambda = .58, $F_{42,14483} = 41.89$, $p < .001$, $\eta^2 = .086$. Since the multivariate test was significant, univariate F-tests were examined to identify differences in adolescent outcomes by parent type. All of the univariate F 's were significant, $p < .001$ (Table 7.4).

Bonferroni post hoc tests were used to test for differences among the parent types on each of the adolescent outcomes. Means and standard deviations on each of the outcomes are displayed in Table 7.5. Differences that are not significant at the 99% level of confidence adjusted for the number of tests are noted.

As expected, adolescents with authoritative parents showed more positive ratings across all adolescent outcomes. On positive outcomes—academic competence, commitment to school, social competence, self-worth, and mastery – adolescents with authoritative parents received higher mean ratings than those with any other parenting type. For substance use and problem behaviors, however, authoritative parenting was not significantly better than warm authoritarian or permissive parenting.

Table 7.4

Univariate *F*-Tests for Differences in Adolescent Outcomes by Parent Type

Adolescent Outcome	<i>F</i>	<i>df</i>	<i>p</i> <	Adjusted <i>R</i> ²
Academic Competence	70.27	6, 3093	.001	0.118
Commitment to School	81.02	6, 3093	.001	0.134
Social Competence	47.01	6, 3093	.001	0.082
Self-Worth	125.67	6, 3093	.001	0.194
Mastery	196.82	6, 3093	.001	0.275
Substance Use	57.13	6, 3093	.001	0.098
Problem Behaviors	72.34	6, 3093	.001	0.121

Table 7.5

Adolescent Outcome Means and Standard Deviations by Parent Type

Adolescent Outcome (N)	Authoritative (747)	Warm Authoritarian (552)	Permissive (639)	Authoritarian (388)	Mediocre (491)	Rejecting (224)	Indifferent (59)	Total (3100)
Academic Competence								
Mean	.93	.25 ^a	.37 ^a	-.46 ^{b,c}	-.23 ^b	-.93 ^d	-1.04 ^{c,d}	.16
Standard Deviation	1.46	1.59	1.58	1.50	1.64	1.84	1.71	1.68
Commitment to School								
Mean	3.71	3.44 ^e	3.38 ^e	3.17 ^f	3.13 ^f	2.90 ^g	2.65 ^g	3.36
Standard Deviation	.63	.64	.63	.67	.67	.73	.66	.71
Social Competence								
Mean	3.31	3.14 ^b	3.16 ^b	2.81 ^{ij,k}	2.95 ^{i,l}	2.75 ^{ij,m}	2.77 ^{k,l,m}	3.08
Standard Deviation	.62	.60	.60	.65	.65	.79	.64	.66
Self-Worth								
Mean	3.44	3.10 ⁿ	3.17 ⁿ	2.65 ^o	2.81 ^p	2.42 ^q	2.62 ^{o,p,q}	3.04
Standard Deviation	.59	.63	.64	.68	.64	.81	.69	.72
Mastery								
Mean	3.53	3.17	3.29	2.84 ^r	3.00	2.52 ^s	2.69 ^{r,s}	3.16
Standard Deviation	.43	.49	.45	.51	.48	.60	.60	.56
Substance Use								
Mean	-.19 ^{t,u}	-.14 ^{t,v,w}	-.10 ^{u,v,x,y}	-.01 ^{w,x,z}	.01 ^{y,z}	.36	1.01	-.05
Standard Deviation	.25	.36	.40	.67	.55	1.28	1.95	.64
Problem Behaviors								
Mean	-.20 ^{aa,bb}	-.16 ^{aa,cc}	-.12 ^{bb,cc,dd,ee}	-.02 ^{dd,ff}	-.00 ^{ee,ff}	.33	1.24	-.06
Standard Deviation	.24	.28	.37	.67	.62	1.20	2.14	.64

Note: Shaded means are significantly different from all others, $p < .001$.

Letters indicate pairs of means that are **not significantly different**, $p > .001$.

Across all of the adolescent outcomes, authoritative, warm authoritarian, and permissive parent types tended to be associated with higher than average levels of positive outcomes and lower than average levels of negative outcomes. Authoritarian, mediocre, rejecting and indifferent parent types were associated with poorer than average outcomes. Adolescents with rejecting parents were significantly more likely than adolescents with authoritative, warm authoritarian, permissive, authoritarian, and mediocre parents to have engaged in substance use and problem behaviors. Adolescents with indifferent parents were more likely than all other adolescents to have engaged in substance use and problem behaviors.

Table 7.6 displays means and standard deviations by parent type on the measures of overall competence and overall problem behaviors. MANOVA indicated that there were significant differences among the parent types on a combined function of overall competence and overall problem behaviors, Wilks Lambda = .646, $F_{12,6702} = 136.41, p < .001$. Univariate F-tests for both overall competence and overall problem behaviors were significant (Table 7.7).

Post hoc significance tests were conducted using Bonferroni t-tests. The pattern of means on overall competence suggests an ordering of parent types with authoritative parenting associated with higher performing adolescents followed by warm authoritarian and permissive, authoritarian, mediocre, and finally, rejecting and indifferent. There was not a significant difference in adolescent overall competence between warm authoritarian and permissive parenting, nor was there a significant difference on overall competence for the rejecting and indifferent groups.

Table 7.6

Cluster Means and Standard Deviations

Adolescent Outcome (N)	Authoritative (747)	Warm Authoritaria n (552)	Permissive (639)	Authoritaria n (388)	Mediocre (491)	Rejecting (224)	Indifferent (59)	Total (3100)
Overall Competence								
Mean	.51	.10 ^a	.17 ^a	-.36	-.20	-.64 ^b	-.69 ^b	.03
Standard Deviation	.55	.55	.54	.54	.56	.65	.64	.66
Overall Problem Behaviors								
Mean	-.19 ^{c,d}	-.14 ^{c,e}	-.11 ^{d,e,f}	.03 ^g	.01 ^{f,g}	.40	1.26	-.03
Standard Deviation	.22	.35	.34	.71	.51	1.26	2.10	.68

Note: Shaded means are significantly different from all others in that row, $p < .005$.

Letters indicate pairs of means that are not significantly different, $p > .005$.

Table 7.7

Univariate *F*-Tests for Differences in Overall Competence and Overall Problem Behaviors

Adolescent Outcome	<i>F</i>	<i>df</i>	<i>p</i> ≤	Adjusted <i>R</i> ²
Overall Competence	234.10	6, 3352	.001	.294
Overall Problem Behaviors	85.52	6, 3352	.001	.131

Adolescents with authoritative, warm authoritarian and permissive parents tended to be least likely to engage in overall problem behaviors. Adolescents with authoritarian or mediocre parents engaged in average levels of overall problem behaviors, while adolescents with rejecting parents were more likely to engage in overall problem behaviors. Adolescents with indifferent parents were significantly more likely than all other adolescents to engage in overall problem behaviors.

Summary of Analysis of Parent Types and Adolescent Outcomes

This chapter reported the results of cluster analysis to identify groups of adolescents with similar perceptions of their parents. Adolescents were grouped into seven clusters based on their parenting dimension scores. The clusters were labeled to correspond to their patterns of means on the parenting dimension. Seven parent types emerged: authoritative, warm authoritarian, permissive, authoritarian, mediocre, rejecting and indifferent. The parent types were generally similar to those identified by earlier researchers except for the inclusion in this study of a rejecting parent type.

After establishing that groups of adolescents could be identified based on their perceptions of parent behaviors, analyses addressed the question of whether these groups with different parent types varied on a set of adolescent outcomes including academic competence, commitment to school, social competence, self-worth, mastery, substance use, and problem behaviors. Means on positive adolescent outcomes and problem behaviors suggested an ordering by parent type with adolescents with authoritative parents experiencing the best outcomes followed by warm authoritarian, permissive, authoritarian, mediocre, rejecting and indifferent. Although adolescents with authoritative parents had the highest means on positive outcomes, their means on substance use and problem behaviors were not significantly different than the means for adolescents with warm authoritarian and permissive parents. In general, adolescents with authoritative, warm authoritarian and permissive parents scored higher than the overall mean on all positive outcomes and lower than the overall means on substance use and problem behaviors. Adolescents with authoritarian, mediocre, rejecting, and indifferent parents had mean ratings below the overall sample means on positive academic outcomes and higher means on substance use and problem behaviors. Adolescents with indifferent parents had significantly higher means on substance use and problem behaviors than all other adolescents.

Chapter 8

Alcohol and Marijuana Use

This chapter explores adolescent alcohol and marijuana use and its relationships with overall adolescent competence and perceived parenting. Based on Baumrind (1987, 1991) and Barber's (1997a) observations that some engagement in problem behaviors is normative and may not be associated with poorer overall outcomes, it was expected that low levels of adolescent risk-taking would not necessarily undermine healthy adolescent development. Further, it was expected that perceptions of parenting as represented by the parenting dimensions would vary depending on levels of alcohol and marijuana use. Two hypotheses were used to test these premises:

(H3) Adolescents who are triers of alcohol and marijuana, but who do not engage in monthly or more frequent use of alcohol or marijuana, will score as well on a measure of overall competence as nonusers of alcohol and marijuana.

(H4) Patterns of parenting dimensions will be different for frequent alcohol and marijuana users versus low level users.

Adolescents were classified into six mutually exclusive groups to facilitate the examination of H3 and H4: (1) Nonusers, (2) Triers of alcohol (no marijuana use), (3) Triers of marijuana (may have also tried alcohol), (4) Recreational users of alcohol and/or marijuana, (5) Regular users, (6) Heavy users. Details on the frequency of use for each of these groups is provided in the Method section in Chapter 5. The percent of

adolescents by grade in each of the alcohol and marijuana user groups is displayed in Table 8.1. In general, trial and use of alcohol and marijuana increased with grade level. Among eighth graders, 47.3% had never tried alcohol or marijuana. By 12th grade, only 19.7% had never tried alcohol or marijuana. Since students in lower grades were less likely to have ever tried alcohol and marijuana, the analyses which follow were conducted separately for grades 8, 9-10, and 11-12.

Table 8.1

Alcohol and Marijuana User Groups by Grade

User Group (<i>n</i>)	Grade					Total
	8	9	10	11	12	
	(995)	(969)	(648)	(598)	(117)	(3327)
	%	%	%	%	%	%
Nonusers	47.3	35.1	33.2	27.8	19.7	36.5
Triers - alcohol	21.0	19.8	20.8	17.7	11.1	19.7
Triers - marijuana	4.6	4.7	4.8	4.7	6.8	4.8
Recreational users	7.2	10.7	6.6	12.0	10.3	9.1
Regular users	5.7	8.7	11.3	14.2	12.8	9.4
Heavy users	14.1	20.9	23.3	23.6	39.3	20.5
Total	100.0	100.0	100.0	100.0	100.0	100.0

Multiple regression was used to test H3. Alcohol and marijuana use were dummy coded in the regression model as follows:

	<u>X1</u>	<u>X2</u>	<u>X3</u>	<u>X4</u>	<u>X5</u>
Nonusers	0	0	0	0	0
Triers-alcohol	1	0	0	0	0
Triers-marijuana	0	1	0	0	0
Recreational users	0	0	1	0	0
Regular users	0	0	0	1	0
Heavy users	0	0	0	0	1

The resulting five vectors were used in the regression models to predict overall competence for grades 8, 9-10, and 11-12. The regression constant or intercept is the mean on overall competence for the group coded as 0 across all vectors, in this analysis, nonusers. The regression coefficients indicate the difference between the mean for that group and the nonuser group. Significant coefficients indicate significant differences in means.

Results of three separate regression analyses testing H3 for 8th, 9-10th, and 11-12th grades are displayed in Table 8.2. The results varied depending on grade. Among 8th graders, H3 was rejected. Overall competence scores for groups of 8th graders who had tried or used alcohol and marijuana were significantly lower than overall competence scores for nonusers. For grades 9-10 and 11-12, H3 was not rejected. For grades 9-10, overall competence was not significantly different for triers of alcohol than for nonusers. All other groups had significantly lower overall competence scores than nonusers. For grades 11-12, overall competence was not significantly different for triers of alcohol or triers of marijuana than for nonusers. All other groups had significantly

Table 8.2

Test of Differences among User Groups on Overall Competence by Grade

User Group	Grade 8			Grade 9-10			Grade 11-12		
	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>
Nonusers (Constant)	.24			.25			.25		
Triers-alcohol	-.21	-3.52	.001	-.08	-1.72	.085	-.11	-1.47	.144
Triers-marijuana	-.57	-4.88	.001	-.31	-3.75	.001	-.16	-1.34	.181
Recreational users	-.34	-3.51	.001	-.35	-5.64	.001	-.22	-2.49	.010
Regular users	-.60	-5.67	.001	-.34	-5.46	.001	-.27	-3.43	.001
Heavy users	-.60	-8.03	.001	-.58	-12.23	.001	-.36	-5.07	.001

lower overall competence scores than nonusers. Means on overall competence for each group are displayed in Table 8.3.

These findings indicate that for adolescents in grade 8 any use of alcohol and marijuana is associated with lower levels of overall competence. However, for those in grades 9-10 and 11-12, some low levels of alcohol or marijuana experimentation may not be significantly associated with reduced overall competence. For grades 9-10, significantly reduced competence begins in the triers of marijuana group. For grades 11-12, significantly reduced competence begins with the recreational users group.

Table 8.3

Mean Overall Competence by User Group

User Group (<i>n</i>)	Grade		
	8 (791)	9-10 (1402)	11-12 (640)
Nonusers	.24	.25	.25
Triers - alcohol	.03*	.16	.13
Triers - marijuana	-.33*	-.06*	.09
Recreational users	-.10*	-.11*	.03*
Regular users	-.36*	-.10*	-.03*
Heavy users	-.36*	-.34*	-.11*
Total	.04	.03	.07

*Significantly different than nonusers, $p < .01$.

Since tests of H3 showed significant reductions in overall competence with any alcohol or marijuana use by 8th graders and with any trial of marijuana for the 9-10th graders, only 11-12th graders were used to test H4. Profile analysis was used to determine whether patterns of scores on parenting dimensions differed by user group. For this analysis, user groups were recoded to form (1) a triers group that included triers of alcohol and triers of marijuana, and (2) a recreational plus users group that combined recreational, regular, and heavy users.

Profile analysis was performed using the seven parenting dimensions as repeated dependent variables and user group as the grouping variable. SPSS repeated measures MANOVA was used to conduct the analysis. Means and standard deviations on the

seven parenting dimensions for these two groups are displayed in Table 8.4. The resulting profiles are displayed in Figure 8.1.

The test for parallelism indicated that the patterns of means for triers and recreational plus users deviated significantly from one another, Wilks' Lambda = .97, $F_{6,491} = 2.91$, $p = .008$, $\eta^2 = .034$. The test for flatness indicated that there were significant differences among the means on the parenting dimensions within at least one of the user groups, Wilks' Lambda = .34, $F_{6,491} = 159.54$, $p < .001$, $\eta^2 = .661$. The levels test indicated no significant difference in the overall average across the parenting dimensions for triers vs. recreational plus users, $F_{1,496} = 2.30$, $p = .130$.

Table 8.4

Mean Parenting Dimension Scores for Triers¹ and Recreational Plus Users²

(n)	Triers (151)		Recreational Plus Users (347)	
	Mean	SD	Mean	SD
Parenting Dimension				
Warmth	3.51	.58	3.41	.69
Structure	3.01	.64	2.95	.65
Autonomy Support	3.28	.68	3.22	.69
Monitoring	3.48	.59	3.26	.68
Rejection ³	3.48	.63	3.45	.64
Chaos ³	3.00	.67	2.87	.64
Coercion ³	2.60	.70	2.71	.63

1) Triers of alcohol and triers of marijuana

2) Recreational, regular and heavy users

3) Reverse coded

MANOVA was used to follow up on the significant parallelism test. Before examining these results a comparison of the profile analysis test of parallelism and MANOVA is in order. The test for parallelism addresses hypotheses about adjacent segments of the profile (Tabachnick & Fidell, 2001). For example, in the current analysis, the test asks if the difference between adjacent parenting dimensions (Warmth vs. Structure, Structure vs. Autonomy Support, Autonomy Support vs. Monitoring, etc.) are the same for triers and recreational plus users. In contrast, MANOVA explores differences in the original dependent variables, in this case, parenting dimensions. Although it seems logically inconsistent to follow up a segments test with a test based on original scores, Tabachnik and Fidel (2001) suggest that "... performing contrasts on

segments or some other transformation of the original variables seems even worse because of difficulty in interpreting the results” (p. 411).

The MANOVA results indicated that there was at least one difference by user group among the set of related parenting dimensions, Wilks’ Lambda = .96, $F_{7,490} = 7030.98$, $p = .007$, $\eta^2 = .038$. Follow up univariate F tests indicated a significant difference by user group on parental monitoring (Table 8.5). These findings indicate that adolescents who were triers of alcohol or marijuana were more likely to rate their parents higher on monitoring than were adolescents who were recreational plus users.

Table 8.5

Univariate F Tests for Parenting Dimensions by User Group

Parenting Dimension	F	df	p	η^2
Warmth	2.49	1, 496	.115	.005
Structure	.79	1, 496	.374	.002
Autonomy Support	.72	1, 496	.396	.001
Monitoring	11.52	1, 496	.001	.023
Rejection	.28	1, 496	.596	.001
Chaos-reversed	4.10	1, 496	.043	.008
Coercion-reversed	2.79	1, 496	.096	.006

Summary of Alcohol and Marijuana Use

This chapter explored adolescent alcohol and marijuana use and its relationship to overall competence. It was expected that low-level users of alcohol or marijuana would not be different from nonusers on a measure of overall competence. Further, it was expected that the profile of means on parenting dimensions for low level users would be significantly different from the profile for heavier users.

Mean levels of overall competence for six user groups – nonusers, triers of alcohol, triers of marijuana, recreational users, regular users, and heavy users – were compared using multiple regression for 8th, 9-10th, and 11-12th graders. Findings indicated that for 8th graders any trial of alcohol or marijuana was associated with lower levels of overall competence. For 9-10th graders, triers of alcohol were not significantly less competent than nonusers. For 11-12th graders, triers of alcohol and triers of marijuana were not significantly less competent than nonusers. Thus, it appears that, at least for older adolescents, some experimentation with alcohol and marijuana may not, necessarily, be associated with lower levels of competence.

Profile analysis was used to determine whether patterns of parenting dimension scores were different for 11-12th graders in two user groups, those who had tried alcohol and/or marijuana and those who were recreational plus users. Findings indicated that the patterns depended on user group. Follow up tests indicated that those who were triers of alcohol and marijuana gave their parents higher scores on monitoring than did those in the recreational plus group. These findings suggest that parental monitoring may help to distinguish triers of alcohol and marijuana from heavier users.

Chapter 9

Risk Factors for Adolescent Problem Behaviors

Researchers have identified two categories of factors that are associated with adolescent problem behaviors such as alcohol and drug use, theft, and vandalism. Risk factors are those that are positively associated with problem behaviors and protective factors are those that are negatively associated with problem behaviors. This chapter reports findings from an analysis aimed at determining whether positive parenting dimensions (warmth, structure, autonomy support, and monitoring) serve as protective factors that moderate the effects of risk factors. Since a warmth by gender interaction in predicting overall problem behavior was identified earlier, this analysis was conducted for boys only to avoid multiple interactions.

Thirteen risk factors were combined to calculate an overall risk factor score for each boy. The thirteen risk factors used as indicators of overall risk, their means and standard deviations are displayed in Table 9.1. Since the individual risk factor means were calculated from dichotomous variables, the means carry the proportion of respondents considered at risk due to that factor. The means ranged from .28 for lack of rewards for conventional behavior to .10 for risk due to interaction with antisocial peers.

Table 9.1

Dichotomous Risk Factor Means and Standard Deviations for Boys Only

Dichotomous Risk Factor	Mean	Std. Deviation	N
Low neighborhood attachment	.21	.41	1610
Community disorganization	.16	.37	4629
Transitions and mobility	.17	.37	1607
Perceived availability of drugs and handguns	.19	.39	1621
Norms favorable to drug use	.17	.37	1602
Adult models for delinquent behavior	.18	.39	1603
Low likelihood of being caught	.27	.44	1635
Parental acceptance of drug use	.12	.33	1844
Parental acceptance of delinquent behavior	.14	.34	1853
Interaction with antisocial peers	.10	.30	1742
Friends' use of drugs	.18	.38	1740
Rewards for antisocial involvement	.16	.36	1755
Lack of rewards for conventional involvement	.28	.45	1618
Overall risk score	2.27	2.38	1613

The overall risk score mean of 2.27 (which is the mean number of risk factors identified) indicates that most of the boys had few risk factors. About 25% had no risk factors and only 10% had six or more risk factors for problem behaviors.

Since substantial multicollinearity was expected in the model to test for moderators, centered variables were used to calculate the interaction terms: risk x

warmth, risk x structure, risk x autonomy support, and risk x monitoring. Table 9.2 displays the correlations among overall problem behaviors, the overall risk score, the good parenting dimensions (warmth, structure, autonomy support, and monitoring), and the interaction terms. All of the correlations were statistically significant, $p < .01$. Centering the variables reduced the correlations between the risk score and the four risk by parenting dimension interactions, and between the parenting dimensions and risk by parenting dimension interactions. However, strong intercorrelations remained among the positive parenting dimensions and among the risk by parenting dimension interactions. Thus, it was expected that multicollinearity might prevent some of the parenting dimensions and some of the interaction terms from having significant regression coefficients despite their moderate correlations with overall problem behaviors.

Results of a hierarchical multiple regression predicting overall problem behaviors from demographic control variables (step 1), overall risk and positive parenting dimensions (step 2), and the set of risk by parenting dimension interactions (step 3) are provided in Tables 9.3 and 9.4. Demographic control variables explain a small (1.6%), but significant, portion of the variance in overall problem behaviors. The overall risk score and parenting dimensions explained an additional 37.6% of the variance, and the set of interactions explained 7.6% of the variance in overall problem behaviors.

Table 9.2

Correlations among Overall Problem Behaviors, Overall Risk Score, Parenting Dimensions, and Interaction Terms

	Overall Problem Behavior	Risk Score	Warmth	Structure	Autonomy Support	Moni- toring	Risk x Involve- ment	Risk x Structure	Risk x Autonomy Support
Overall Problem Behavior	--								
Overall Risk Score	.61	--							
Warmth	-.35	-.41	--						
Structure	-.27	-.35	.72	--					
Autonomy Support	-.28	-.36	.72	.68	--				
Monitoring	-.34	-.42	.48	.54	.40	--			
Risk x Warmth	-.53	-.42	.45	.31	.31	.36	--		
Risk x Structure	-.44	-.37	.36	.32	.28	.32	.82	--	
Risk x Autonomy Support	-.46	-.40	.35	.27	.34	.27	.81	.79	--
Risk x Monitoring	-.46	-.42	.34	.27	.23	.47	.74	.70	.60

N=1528

Note: All correlations are significant at the .01 level.

Risk Score, Warmth, Structure, Autonomy Support, and Monitoring were centered.

Interactions were calculated using centered variables.

Table 9.3
Regression Model Predicting Overall Problem Behaviors: Variance Explained

Step 3	R^2	Adjusted R^2	$R^2\Delta$	$F\Delta$	df	$p<$
1. Control Variables	.016	.014	.016	8.19	3, 1524	.001
2. Risk Score and Parenting Dimensions	.391	.388	.376	187.51	5, 1519	.001
3. Interactions	.468	.464	.076	54.44	4, 1515	.001

Table 9.4
Regression Model Predicting Overall Problem Behaviors: Coefficients

Step	<i>b</i>	β	<i>t</i>	<i>p</i> ≤
Control Variables				
Grade	-.01	-.02	-1.16	.246
Race	.08	.04	2.07	.035
Family Type	-.07	-.04	-2.42	.025
Risk Score and Parenting Dimensions				
Risk Score	.15	.46	19.89	.001
Warmth	-.01	-.01	-.09	.930
Structure	.03	.03	.93	.353
Autonomy Support	-.02	-.01	-.45	.653
Monitoring	-.06	-.04	-1.81	.071
Interactions				
Risk Score x Warmth	-.10	-.32	-7.74	.001
Risk Score x Structure	.02	.05	1.33	.185
Risk Score x Aut Support	-.01	-.02	-.59	.557
Risk Score x Monitoring	-.01	-.04	-1.24	.214
Constant	-.13			

Note: Risk score and parenting dimensions were centered.

Regression coefficients indicate that the largest contributors to prediction of overall problem behaviors were the overall risk factor score and the risk by warmth interaction (Table 9.4). The interaction of risk score and warmth is displayed in Figure 9.1. The interaction of risk and warmth was evaluated by holding other variables constant at their means, and allowing the risk and warmth to take on values of -1 and +1 standard deviations from their means. When risk was high, an increase in warmth

resulted in lower levels of overall problem behaviors. When risk was low, an increase in warmth was associated with more overall problem behaviors. Although the findings for the low risk condition seem counterintuitive, it may be the case that when risk is low and problem behaviors increase, parents step up their parenting activity resulting in adolescent perceptions of higher warmth.

Summary of Risk Factors for Adolescent Problem Behavior

Warmth, structure, and autonomy support were expected to be moderators of the relationship between risk factors and problem behaviors. The findings indicated, however, that when warmth by risk, structure by risk, autonomy support by risk, and monitoring by risk were included in a single model to predict problem behaviors, only the warmth by risk interaction explained unique variance in problem behaviors. Simple correlations indicated that each of the interactions had moderately strong negative

relationships with overall problem behaviors and that the interactions had strong positive interrelationships. These patterns of correlations indicate that warmth, structure, autonomy support, and monitoring have overlapping roles in buffering the effects of risk factors.

Chapter 10

Healthy Adolescent Development

The purpose of this project was to explore the relationship between parenting and adolescent outcomes within the context of healthy adolescent development. Adolescent and parent behaviors have been conceptualized from the perspective of a motivational model of development that posits that individuals actively construct the self and seek experiences to satisfy three basic psychological needs: relatedness, competence and autonomy. According to the motivational model, the individual's need for relatedness will be met when the environment is experienced as warm and loving rather than neglectful or rejecting. The need for competence will be met when the environment is experienced as providing structure in the form of contingent responsiveness, clear expectations for behavior, and consistency rather than when the environment is experienced as unpredictable and chaotic. The need for autonomy will be met when the environment provides autonomy support in the form of respect, freedom of expression, and self-determination rather than when the environment is experienced as coercive.

Within this framework, adolescent risk-taking behaviors have been viewed as functional to the extent that they may help adolescents to build relationships with peers, test their ability to achieve desired outcomes, and achieve independence from parents.

Although adolescents may obtain feelings of relatedness, competence and autonomy from a variety of interactions with peers, school and other environments, parents continue to play a substantial role in helping adolescents satisfy their basic needs through the provision of warmth, structure, and autonomy support. Further, while adolescents are appraising their feelings of relatedness, competence, and autonomy, parents are doing the same in efforts to meet their own psychological needs.

The task of parents has been defined as contributing to an environment that provides ample amounts of warmth, structure and autonomy support in which adolescents can experience relatedness, competence, and autonomy. Using these concepts, this study sought to (a) extend the current understanding of parenting dimensions and their links to adolescent competence and problem behaviors, (b) examine the effects of alcohol and marijuana use on adolescent competence and to consider the implications of those effects for parenting, and (c) determine whether parental provision of warmth, structure, and autonomy support moderate adolescent risks for problem behaviors. These study aims provide the framework for the following discussion of findings. (See Table 10.1, p. 186 for a brief summary of findings and discussion.) Specific research questions are noted in each section. A discussion of the strengths and limitations of the study and areas for future research concludes the chapter.

Discussion of Findings

Measurement of Parenting Dimensions

A review of the parenting literature revealed three recurring dimensions of parenting that correspond to the motivational model. The various ways these dimensions have been conceived in prior research influenced the decision to explore three- and six-dimensional parenting models in the current study. The first and most frequently researched dimension was one that represents parental warmth. This dimension has been studied under a variety of labels including warmth versus hostility, acceptance versus rejection, attachment, involvement and connectedness. The second dimension was one that deals with parental restrictiveness versus permissiveness, firm control versus lax control (structure versus chaos), regulation, monitoring, and behavioral control. The third dimension represented parental support for a child's autonomy versus the use of psychological control (coercion). In some studies parenting has been represented as having bipolar dimensions; in others, dimensions were represented by a single unidirectional concept such as connectedness.

Drawing upon the motivational model of development, it was hypothesized that six dimensions of parenting (warmth, rejection, structure, chaos, autonomy support, and coercion) would underlie parenting styles. However, since other researchers had conceptualized parenting dimensions as bipolar, the idea that warmth and rejection, structure and chaos, and autonomy support and coercion might combine to form three dimensions was also entertained.

Before the question of whether there are three or six dimensions of parenting could be addressed, a recently constructed set of 48-items designed to tap adolescent perceptions of parental warmth, rejection, structure, chaos, autonomy support, and coercion was analyzed and refined. The resulting measurement model was one that included four parenting items as indicators of each of the six dimensions of parenting. The overall model had strong goodness of fit measures (GFI=.95, AGFI=.94, CFI=.96) and the six dimensions had reliabilities ranging from .71 to .88. The parenting dimensions have substantial correlation with one another, but sufficient separation to indicate that adolescents can report distinctions in their parents' behaviors consistent with the dimensions expected from the motivational theory.

Are there six distinct parenting dimensions (i.e., warmth, rejection, structure, chaos, autonomy support, and coercion) or are there three bipolar dimensions (warmth vs. rejection, structure vs. chaos, and autonomy support vs. coercion)? Findings from confirmatory factor analyses indicated that a six-dimension parenting model fit the data substantially better than a three-dimension parenting model. However, intercorrelations among the parenting dimensions were high. While relatively high intercorrelations among the positive parenting dimensions were expected based on Eccles (1997) and Barber and Olsen (1997), the parenting dimensions correlations in the current study were particularly strong. These findings would seem to support a variety of conceptualizations and aggregations of dimensions of parenting. The high correlations among positive parenting dimensions (.70 to .74) could justify combination of warmth, structure, and autonomy support into a measure of supportive parenting. Similarly,

rejection, chaos, and coercion with intercorrelations ranging from .50 to .62 might form a reasonable measure of unsupportive parenting. Less convincing, however, would be the combination of structure and chaos with a correlation of $-.38$ or autonomy support and coercion with a correlation of $-.45$ to form bipolar parenting dimensions.

An unexpected finding of the analysis of parenting dimensions was that items which measured monitoring (which were expected to group with the structure items) formed a separate dimension. In this study's review of literature, monitoring was judged to be a component of structure. Monitoring has been included in numerous studies and found to have a significant positive relationship with academic competence and a negative relationship with substance use and delinquency (Barber, 1996; Barber et al., 1994; Brown et al., 1993; Coombs & Ladsvark, 1988; Dornbusch et al., 1997; Herman et al., 1997). Due to the prominent role of monitoring in these studies and because it was not represented within any of the six dimensions, it has been included as a seventh dimension of parenting in many of the analyses conducted during this study. Monitoring was not included in the development and testing of the measurement model that corresponds to the dimensions specified by the motivational model of development, but was included in all other analyses that involved parenting dimensions.

Parenting Dimensions and Adolescent Outcomes

How are parenting dimensions related to adolescent outcomes? Simple correlations between each of the parenting dimensions and the nine adolescent outcomes indicated that all of the relationships between parenting dimensions and adolescent outcomes were in the expected direction and significant. Positive parenting dimensions

(warmth, structure, autonomy support, and monitoring) were positively related to academic competence, commitment to school, social competence, self-worth, mastery, and overall competence and negatively related to substance use and problem behaviors. Negative parenting dimensions (rejection, chaos, and coercion) were positively related to substance use and problem behaviors and negatively related to the set of positive adolescent outcomes. In terms of strength of relationships, the strongest simple correlations between parenting dimensions and adolescent outcomes were for autonomy support with mastery and overall competence, for rejection (negatively) with mastery and overall competence, and for monitoring and warmth (negatively) with substance use and problem behaviors.

By gender, the correlations between parenting dimensions and adolescent outcomes were all in the expected directions, but there were some variations in the strengths of the relationships. Structure had a stronger relationship to positive outcomes for girls than for boys, and chaos had a stronger negative relationship with positive outcomes for girls than for boys. In general, there was less difference between boys and girls in the magnitude of the correlations between parenting dimensions and both substance use and problem behaviors.

In addition to the simple correlational relationships noted above, multiple regression was used to examine the unique relationships between parenting and adolescent outcomes. Multicollinearity, indicated by the strong correlations among the parenting dimensions, prevented some of the parenting dimensions from explaining unique variance in some of the adolescent outcomes. For example, when included in

regression models with demographic control variables, other parenting dimensions, and selected interactions, warmth did not have a significant relationship with any of the positive adolescent outcomes and structure had a significant relationship with only commitment to school.

The variables making the largest unique contribution to positive adolescent outcomes as indicated by their standardized regression coefficients were autonomy support, rejection, chaos, monitoring, and an autonomy support by chaos interaction. The interaction between autonomy support and chaos was consistent across all of the models predicting positive adolescent outcomes. When parental chaos was low, higher levels of autonomy support were associated with higher academic competence, commitment to school, social competence, self-worth, mastery, and overall competence. When parental chaos was high, higher autonomy support was associated with little or no change in positive outcomes. Although the overall effects of the set of interactions on positive adolescent outcomes was small, the effects were consistent across all positive adolescent outcomes. It should be noted that an alternative interpretation of the chaos by autonomy support interactions might be that when adolescent competence is high and chaos is low, parents provide more autonomy support. It is also possible that this could be described as a positive reinforcement loop with higher levels of parental autonomy leading to higher levels of adolescent competence and higher levels of adolescent competence leading to higher levels of parental autonomy.

Warmth, rejection, coercion, and monitoring were the parenting dimensions most strongly associated with adolescent substance use and problem behaviors. In

general, warmth, structure, and monitoring were associated with lower levels of overall problem behaviors. Exceptions occurred when high levels of coercion were present with high levels of warmth or structure. High levels of warmth and structure were associated with more overall problem behaviors when coercion was high. Some effects also varied by gender with boys showing greater increases in substance use than girls when rejection was high, and girls showing greater increases in problem behaviors when warmth and coercion were both high. A possible explanation for these findings may be that when parents are generally high on warmth, structure, or monitoring, they increase the level of coercion in response to adolescent engagement in substance use and problem behaviors. Alternatively, it may be that when coercion is low, an increase in warmth, structure, or monitoring leads to more problem behaviors, and when coercion is high, an increase in warmth, structure, or monitoring has little affect or leads to an increase in problem behaviors.

The relationships reported above are generally consistent with those reported in other studies with a few exceptions. The most notable difference is the finding of multiple low-level interactions. The patterns of interactions that emerged suggest that these interactions were not chance occurrences.

The consistency of the contribution of autonomy support and of the interactions between autonomy support and chaos in predicting positive adolescent outcomes is interesting. While the theoretical importance of psychological autonomy has been well documented, few attempts have been made previously to measure parental support for psychological autonomy among adolescents. Instead, measures of psychological control

have been reverse scored and used as indicators of parental support for autonomy (Barber et al., 1994; Barber, 1996; Barber & Olsen, 1997; Conger et al., 1997). These measures would more aptly have been labeled “absence of coercion” rather than psychological autonomy. Consistent with the motivational model, the measure of autonomy support used in this study represents trust, freedom of expression, and respect. In this study, autonomy support has emerged as an important predictor of adolescent competence.

Although multicollinearity has been reported between measures of parental connection (warmth), regulation (structure), and autonomy (Barber and Olsen, 1997; Eccles et al., 1997), Eccles and associates reported that all three parenting dimensions made unique contributions to academic outcomes. In the current study, parental warmth and structure did not make a unique contribution to academic competence or to commitment to school. This difference in findings may be due to differences in the measurement of parenting constructs. Regulation in Eccles’ study was primarily a measure of monitoring. Monitoring was also a significant predictor of academic outcomes in the current study. In addition, the measure of autonomy used by Eccles was a measure of absence of psychological control. With variation in the constructs used to measure the parenting dimensions, some differences should be expected in the unique portions of variance explained.

Consistent with other studies that have included measures of rejection, parental rejection tended to have strong negative relationships with positive adolescent outcomes and strong positive relationships with substance use and problem behaviors (Delaney,

1996; Steinberg & Silverberg, 1986; Fauber et al., 1990). Interestingly, the effects of parental rejection on substance use tended to be stronger for boys than for girls in the current study.

Parent Types

Are different parent types based on varying combination of parenting dimensions associated with differential outcomes? Cluster analysis resulted in the identification of seven parenting types that were generally similar to those identified by earlier researchers. The seven clusters identified were: authoritative, warm authoritarian, permissive, authoritarian, mediocre, rejecting, and indifferent. Authoritative, permissive, authoritarian, and indifferent parents easily fit the descriptions provided in earlier studies (Baumrind, 1971, 1991; Maccoby & Martin, 1983). Warm authoritarian, mediocre, and rejecting types bore some resemblance to parent types identified by other studies, but were in some ways unique. A discussion of these unique types follows.

Warm authoritarian parents were rated moderately high on warmth, structure, autonomy support, and monitoring, and moderately low on rejection. The distinguishing feature of the group was that they were rated higher than average on coercion. Interestingly, this group would not have been identified if autonomy support and coercion had formed a single bipolar dimension. Warm authoritarian parents were higher than average on both autonomy support and coercion, a seemingly inconsistent pattern.

The warm authoritarian parent type identified here is similar in some ways to Baumrind's (1991) *nonauthoritarian directive* type. Baumrind characterized this parent type as loving and influential, but also restrictive and demanding of conformity. Although Baumrind differentiated this group of parents from her authoritarian classification, restrictiveness and demands for conformity are not inconsistent with high scores on coercion. This study suggests that parents who are otherwise warm and supportive can still be effective even when they use higher than average amounts of coercion. It should be noted, however, that the items measuring parental coercion in this study were fairly innocuous (e.g., *My parents are always telling me what to do. My parents say "no" to everything.*) when compared to the harsh, punitive parenting practices described by researchers who reported stronger associations between coercive parenting practices and problem behaviors (Patterson, DeBaryshe, & Ramsey, 1989).

The emergence of two types of authoritarian parents, warm authoritarian and (cold) authoritarian in this study may help to explain some of the conflicting findings that have been reported for authoritarian parenting. Lamborn (Lamborn et al., 1991) and Steinberg (Steinberg et al., 1994) found that adolescents reared in authoritarian homes were similar to those reared in authoritative homes on measures of academic performance, substance use, and delinquency. In contrast, Dornbusch and associates (1987) found authoritarian parenting to be negatively associated with academic performance. In the review of literature presented earlier, it was suggested that these differences might stem from differences in measurement of authoritarian parenting.

Alternatively, these differences might stem from differential amounts of warmth that distinguish two separate types of authoritarian parents.

The mediocre parent type that emerged in the current study was in some ways similar to the group of parents that Baumrind labeled *good enough*. Neither group received any particularly high or low scores on measures of parenting, but while Baumrind's good enough parents scored about average on measures of parenting, the mediocre group scored below the total sample means for warmth structure and autonomy support, and above the total sample means for rejection, chaos, and coercion.

The other parent type that was newly identified in this study was the rejecting parent type. Although rejecting behaviors were noted by Fauber and associates (1990), no parent type had been characterized as rejecting. The rejecting parents in this study were rated lower than the total sample means on warmth, structure, autonomy support, and monitoring, and higher than the total sample means on rejection, chaos, and coercion. They received the highest rejection score of all of the parent types.

It seems likely that the warm authoritarian, rejecting, and mediocre parent types emerged in this study because of the use of seven dimensions to describe parenting. Other parenting taxonomies used two dimensions (Maccoby and Martin, 1983) or four dimensions (Baumrind, 1991). Interestingly, all seven dimensions used in this study played important roles in classifying parent types: Authoritative parents received the highest ratings on positive parenting dimensions (warmth, structure, autonomy support, and monitoring) and lowest ratings on negative parenting dimensions (rejection, chaos, and coercion). Warm authoritarian parents received high scores on positive parenting

dimensions and relatively high scores on coercion. Permissive parents received high scores on warmth and autonomy support, but moderate scores on structure and monitoring. Authoritarian parents received relatively low scores on warmth structure and autonomy support, but relatively high scores on monitoring and coercion. Mediocre parents received lower than average scores on positive parenting dimensions and higher than average scores on negative parenting dimensions. Rejecting parents received low scores on warmth, structure, and autonomy support, and high scores on rejection, chaos, and coercion. The indifferent parent type received low scores on all parent dimensions.

After establishing that parent types could be identified based on adolescents' perceptions of their parents' behaviors, the question of whether adolescent outcomes varied by parent type was addressed. Means on positive adolescent outcomes and problem behaviors suggested an ordering of the parent types such that adolescents with authoritative parents experienced the best outcomes followed by warm authoritarian, permissive, authoritarian, mediocre, rejecting, and indifferent parents. Although adolescents with authoritative parents had the highest means on positive outcomes, their means on substance use and problem behaviors were not significantly different from the means for adolescents with warm authoritarian and permissive parents. Overall, adolescents with authoritative, warm authoritarian, and permissive parents scored higher than the total sample means on all positive outcomes and lower than the total sample means on substance use and problem behaviors. Adolescents with authoritarian, mediocre, rejecting, and indifferent parents had mean ratings below the overall sample means on positive academic outcomes and higher means on substance use and problem

behaviors. Adolescents with indifferent parents had significantly higher means on substance use and problem behaviors than all other adolescents.

The findings reported here for authoritative parenting were similar to other studies. Regardless of the method used to measure parenting style or type, authoritative parenting has been shown to be associated with higher levels of academic competence, self-perceptions, and lower engagement in problem behavior (Baumrind, 1991; Dornbusch et al., 1987; Lamborn et al., 1991; Steinberg et al., 1991, 1992, 1994).

Also similar to other studies, youth with indifferent parents fared more poorly than all other groups (Lamborn et al., 1991; Steinberg et al., 1994). They were significantly more likely than any other group to engage in substance use and problem behaviors and showed the poorest performance on measures of overall competence.

The Effects of Alcohol and Marijuana Use

Is there some level of engagement in alcohol and marijuana use that does not appear to undermine adolescent functioning? It was expected that low-level users of alcohol or marijuana would not be different from non-users on a measure of overall competence. To explore this expectation, mean levels of overall competence for six user groups (nonusers, triers of alcohol, triers of marijuana, recreational users, regular users, and heavy users) were compared using multiple regression. Consistent with other studies that have noted detrimental effects of early onset of alcohol and marijuana use (Jessor, 1987, 1991; Lahey et al., 1999), this study indicated that for 8th graders, any trial of alcohol or marijuana was associated with lower levels of overall competence. For grades 9-10, triers of alcohol were not significantly less competent than nonusers. For

grades 11-12, triers of alcohol and triers of marijuana were not significantly less competent than nonusers. Thus, Baumrind's (1991) findings that exploratory drug use does not undermine development were supported only for older adolescents.

Are patterns of parenting different for adolescents who are regular alcohol and marijuana users versus those who are not? The aim of this question was to gain some insight into whether particular parenting practices help to prevent some adolescents from moving from trial of alcohol and marijuana to more regular use. Profile analysis was used to determine whether patterns of parenting dimension scores were different for 11-12 graders in two user groups, those who had tried alcohol and/or marijuana and those who were recreational plus users. The patterns of means for the two groups were significantly different. Follow up tests indicated that those who were triers of alcohol and marijuana gave their parents higher scores on monitoring than did those in the recreational plus user group. These findings indicate that parental monitoring may help to distinguish triers of alcohol and marijuana from heavier users and are consistent with other studies that have highlighted the importance of monitoring in reducing substance use among adolescents (Coombs & Landsverk, 1988; Loeber & Dishion, 1983). Alternatively, it may be that recreational plus users evade parental monitoring.

Risk and Protective Factors

Do parental warmth, structure, and autonomy support protect adolescents from risk factors for problem behaviors? The risk and protective factor approach to understanding adolescent engagement in problem behaviors has led to the examination of a lengthy list of risk and protective factors. The current study sought to extend our

understanding of the mechanisms through which protective factors influence adolescent engagement in problem behaviors. Parental involvement and family bonding have been identified as protective factors associated with fewer problem behaviors (Catalano & Hawkins, 1996; Hirschi, 1969). It was expected that positive parenting dimensions would moderate the relationship between risk factors and adolescent problem behaviors. Specifically, it was expected that when risk for problem behaviors was high, higher levels of warmth would be associated with lower levels of overall problem behaviors. In addition, it was expected that at low levels of risk, increased warmth would have little effect on problem behaviors. Under conditions of high risk, the stated expectations were supported; however, when risk was low, higher levels of parental warmth were associated with more problem behaviors. Despite this finding, it should be noted that the level of problem behaviors remained well below the mean level of problem behaviors for the overall sample. It may be the case that parents step up their parenting activity when low levels of problem behaviors increase and the result is that adolescents perceive higher levels of warmth.

Structure, autonomy support, and monitoring were also expected to be moderators of the relationship between risk factors and problem behaviors. The findings indicated, however, that when interactions between warmth and risk, structure and risk, autonomy support and risk, and monitoring and risk were included in a single model to predict problem behaviors, only the interaction between warmth and risk explained unique variance in problem behaviors. Simple correlations indicated that each of the interactions had moderately strong negative relationships with overall

problem behaviors and that the interactions had strong positive interrelationships.

These patterns of correlations indicate that warmth, structure, autonomy support, and monitoring have overlapping roles in buffering the effects of risk factors.

Summary of the Findings

This study has contributed to the understanding of parenting dimensions that underlie parenting styles through the identification of six parenting dimensions that correspond to a motivational model of development. In addition, monitoring was identified as a seventh dimension of parenting and was found to have an important influence on adolescent behaviors and outcomes. Further, it was demonstrated that parenting dimensions combine to form a set of at least seven parent types that are differentially associated with adolescent outcomes and problem behaviors.

This study also sought to understand the effects of alcohol and marijuana use on adolescent competence. Consistent with Baumrind's (1991) findings, experimentation with alcohol and marijuana did not appear to significantly undermine overall competence for the 11-12th graders in this study. However, trial of alcohol or marijuana was associated with lower overall competence for 8th graders, and trial of marijuana was associated with lower overall competence for students in grades 9-10. Further research is needed to understand whether the findings for grades 11-12 simply reflect later onset of trial of alcohol and marijuana. The search for differences in parenting that might distinguish between triers and recreational plus users of alcohol and marijuana indicated that parental monitoring of adolescents was higher among triers than among recreational plus users.

A third aim of this research was to determine whether warmth, structure, and autonomy support moderate the relationship between risk factors and adolescent problem behaviors. This analysis represents a first step in an effort to better understand the mechanisms through which protective factors influence problem behaviors. To the extent that warmth, structure, and autonomy support contribute to the adolescent's self-system appraisals of relatedness, competence, and autonomy, it has been suggested that fulfillment of these needs promote positive outcomes and may reduce the need for engagement in risk-taking and problem behaviors.

Table 10.1
Summary of Findings

Research Question	Expectation	Findings	Discussion
<i>Are there six distinct parenting dimensions or three continua?</i>	<p>Based on the motivational model, six dimensions of parenting were expected.</p> <p>Monitoring items from the school questionnaire were expected to load with structure.</p>	<p>A six-dimension model fit better than a three-dimension model. Interdimension correlations were high—highest among positive parenting dimensions, next negative parenting dimensions, lowest between structure and chaos, autonomy support and coercion.</p> <p>Monitoring items formed a dimension separate from structure.</p>	<p>Interdimension correlations may make some combinations of dimensions practical for some purposes.</p> <p>Monitoring was included in subsequent analyses.</p>
<i>How are parenting dimensions related to adolescent outcomes?</i>	<p>Positive parenting with positive outcomes; negative parenting with substance use and problem behaviors.</p> <p>Multicollinearity was expected among the parenting dimensions making it</p>	<p>All simple correlations between parenting dimensions and adolescent outcomes were in expected directions and significant.</p> <p>Substantial multicollinearity prevented warmth and structure</p>	<p>Findings were generally consistent with prior research.</p>

Table 10.1 (continued)
Summary of Findings

Research Question	Expectation	Findings	Discussion
<p><i>How are parenting dimensions related to adolescent outcomes?</i></p> <p>(Continued)</p>	necessary to examine zero-order correlations as well as regression coefficients.	<p>from having unique relationships with most of the positive outcomes.</p> <p>There were small, but consistent, interactions of autonomy support and chaos in predicting all positive outcomes. When chaos was low, higher autonomy support was associated with better outcomes; when chaos was high, higher autonomy support was associated with little or no change in outcomes.</p> <p>High levels of warmth and monitoring were associated with more overall problem behaviors when coercion was high.</p>	<p>The number of tests for interactions increased the probability of finding significant interactions, but patterns suggest they were not chance occurrences.</p>

Table 10.1 (continued)
Summary of Findings

Research Question	Expectation	Findings	Discussion
<i>Are varying combinations of parenting dimensions associated with differential outcomes?</i>	It was expected that varying combinations of parenting dimensions would form parenting types similar to those identified by others.	Cluster analysis resulted in 7 parent types that were similar to those identified by others. A rejecting parent type was the exception. Means on positive adolescent outcomes and problem behaviors suggested an ordering of parent types with authoritative leading to the best outcomes followed by warm authoritarian, permissive, authoritarian, mediocre, rejecting, and indifferent.	Emergence of warm authoritarian and authoritarian types may explain prior differences in adolescent outcomes. Six parenting dimensions were useful in discriminating among the 7 parenting types.
<i>Is there some level of engagement in alcohol and marijuana use that does not appear to undermine adolescent functioning?</i>	It was expected that low level users of alcohol and marijuana would not be different from nonusers on a measure of overall competence.	For 8 th graders, triers of alcohol were less competent than nonusers. For 9-10 graders, triers of marijuana were less competent than nonusers. For 11-12th graders, triers of alcohol and/or marijuana were not significantly less competent than non users.	Baumrind's research was supported only among 11-12th graders.

Table 10.1 (continued) Summary of Findings			
Research Question	Expectation	Findings	Discussion
<i>Are patterns of parenting different for adolescents who are regular alcohol and marijuana users versus those who are not?</i>	It was expected that adolescents who were regular users of alcohol and marijuana would report significantly different parenting patterns than those who were low level users.	Patterns of parenting dimension scores depended on user group. Follow up tests indicated that recreational plus users of alcohol and marijuana gave their parents lower scores on parental monitoring.	Findings are consistent with prior research that indicates monitoring is associated with lower levels of substance use.
<i>Do parental warmth, structure, and autonomy support protect adolescent boys from risk factors for problem behaviors?</i>	Parental warmth, structure, and autonomy support were expected to moderate the relationships between adolescent risk factors and problem behaviors for boys.	Warmth moderated the relationship between risk and problem behaviors. When risk was high, higher levels of warmth were associated with fewer problem behaviors. When risk was low, higher warmth was associated with more problem behaviors.	Analysis was for boys only. When risk is low and problem behaviors increase, parents may respond by increasing their parenting activities. The result of the increased parental involvement may be perceived as greater warmth by the adolescent.

Strengths and Limitations

There are a number of methodological strengths and limitations associated with this study. Some of these stem from sampling and procedures used, others stemmed from the measures used and the overall design of the study.

Sample and Procedures

The opportunity to conduct this study as part of a statewide school survey provided for a large sample size that would otherwise have not been possible. Strengths associated with the large sample include a broad representation of schools from five regions within the state, diversity of students with regard to race, socioeconomic characteristics, and rural versus urban geographic area. The large sample also provided the ability to address measurement issues with greater confidence and to identify less frequently occurring parent types such as the rejecting and indifferent types.

Limitations associated with the sample and procedures included issues related to the ability to detect statistical differences versus the ability to recognize meaningful differences and the large amount of missing data in this study. While large sample size is generally considered a strength, it also presents the researcher with the challenge of distinguishing between statistically significant differences and meaningful differences. In this study a number of interactions among independent variables were identified based on statistical significance; however, due to the small effect sizes of the interactions, their meaningfulness might be challenged. The choice to interpret the interactions and give them a relatively prominent role in the presentation of results was made based on the patterns which emerged. For example, the interaction of autonomy

support with chaos occurred in predicting all five of the positive adolescent outcomes (academic competence, commitment to school, social competence, self-worth, and mastery). The interaction of coercion with positive parenting dimensions also occurred with consistency in predicting substance use and problem behaviors. Nonetheless, given the number of interactions that were tested and the small effect sizes, the possibility remains that the significant interactions may have occurred by chance. These associations need to be replicated with other samples.

The large amount of missing data in this study should also be considered a limitation. Reasons for the missing data likely include the length of the questionnaire, the seeming repetitiveness of the parenting items, and an attempt to shorten the instructions for completing Harter's (1988) *Self-Perception Profile*. Methods for handling missing data included calculating scales for parenting dimensions, outcome measures, and risk factors when at least 75% of the items for each scale were answered. A somewhat complicated procedure for handling Harter's subscales was adopted and described in the method section of Chapter 5. Finally, the number of respondents included in each analysis was allowed to vary with the amount of missing data. To the extent that there may have been systematic variation in the patterns of missing data, findings from this study may be biased.

Measures

The use of multiple measures of adolescent functioning is one of this study's greatest strengths. Adolescent functioning was measured in cognitive, social, emotional, and behavioral domains. Self-reported grades, perceived academic

competence, and commitment to school addressed the cognitive domain; social competence was included as a measure of social functioning; and global self-worth and perceptions of personal control (mastery) addressed the emotional domain. Behavioral outcome measures included substance use and problem behaviors.

In addition to using multiple measures of adolescent and parent functioning, all of the measures had good to very good reliabilities. Chronbach's alpha ranged from .71 to .88 for the parenting dimensions, from .67 to .90 for the risk factors, and from .76 to .83 for measures of adolescent functioning (outcomes).

A measures-related limitation of the study stems from the reliance upon only adolescents' perspectives. Indicators of parenting from multiple perspectives (e.g., reports from observers and reports from parents) would have permitted the construction of more valid parenting dimensions. Multiple sources (e.g., peers, parents, and teachers) for indicators of adolescent functioning would also increase the validity of study findings.

Another measures-related limitation of the study stems from having adolescents rate both parents simultaneously. For some adolescents, the rating may reflect an average of the parenting practices of fathers and mothers. Some may have opted to rate only one parent and others may have rated their mother for some items and their father for other items.

Design Issues

The cross-sectional design of this study made it possible to attain broad geographic coverage and the large sample size. While these are strengths of the current

study, the cross-sectional design also leads to important limitations. Given the cross-sectional design, all of the findings of this study should be considered correlational rather than causal. Despite this limitation, hierarchical multiple regression was used to examine relationships between parenting dimensions and adolescent outcomes and behaviors. Although care was used not to imply causal relationships, the reader should be cautioned that the terminology *predictive of* and *predictor of* were intended to mean predictive of an association among the variables. Interpretation of the interactions of variables with phrasing which suggests a change in measurement over time may also have been misleading.

Given these limitations, especially the cross-sectional nature of this data, it is not possible to draw causal conclusions from this study. Nonetheless, most of the data analyses are consistent with the expectations derived from the motivational model. These analyses have demonstrated the role that self-system processes may take in explaining adolescent behaviors and outcomes as well as in explaining how parental behavior may shape adolescent development.

Future Research

This research effort has been guided by a systems approach which incorporated a model called the Self-System Model of Motivational Development (Connell & Wellborn, 1991) and was influenced by consideration of an ecological perspective that recognizes that self-system processes are embedded within multiple systems (Bronfenbrenner 1977; 1986). Self-system processes represent the individual's continuous appraisal of how well his or her basic psychological needs for relatedness,

competence, and autonomy are being met. When basic needs are not being met, the individual is motivated to seek experiences to fulfill his or her basic needs. The emergent properties of the self-system are the actions of the individual that are motivated by self-system processes. Both parent and child actively construct self-system processes and contribute to one another's social context (See Chapter 2 for more details). Thus, while parenting practices influence adolescent behaviors, adolescent behaviors influence parenting practices.

The current study provides the foundation for additional research efforts that incorporate the self-system model and an ecological perspective. Some of these efforts can be conducted using data collected in the current study and others would require different research designs. Additional efforts employing data collected in this study are discussed below followed by suggestions for future research.

Additional studies using the current data

Microsystem analyses. The current study examined perceived parenting and adolescent outcomes among a diverse group of adolescents. The large sample will permit additional analyses examining the relationships among parenting dimensions and parent types developed in the current study with adolescent outcomes by race/ethnicity, family type (two-parent, single-parent, blended, and nontraditional), and by rural versus urban geography. These variables might be expected to be important since a key feature of Bronfenbrenner's (1986) ecological model is that such social address variables such as socioeconomic status and race can be considered to form ecological "niches" that shape the kinds of parenting that support healthy adolescent development. For example,

when families live in the high risk setting of urban poverty, more restrictive and demanding parenting (such as captured by the parent type “warm authoritarian”) may be needed to protect adolescents from potentially harmful effects of a dangerous context.

Additional analyses might also include an examination of the individual and joint effects of parenting, academic competence, commitment to school, social competence, self-worth, and mastery on substance use and problem behaviors. In the current study, academic competence, commitment to school, social competence, self-worth, and mastery were used as outcome variables. They could also be hypothesized to be independent variables in predicting substance use and other problem behaviors.

Mesosystem analyses. Understanding of the relationships between parenting and adolescent outcomes should be extended by including the multiple influences of parenting, peers, and neighborhood. Analyses conducted for the current study did not include all of the available variables which provide information about peers and neighborhood.. Additional analyses should include examinations of the contributions of perceived parenting, early onset of substance use and problem behaviors, peer problem behaviors, and neighborhood characteristics to adolescent outcomes. Another strategy would be to examine early onset problem behavior adolescents to determine what distinguishes them from other adolescents.

New Research Designs

Microsystem research. One of the limitations of this study was that measures of parenting and adolescent behaviors were collected from only the adolescent’s perspective. Measures of parenting, adolescent competence, and problem behaviors that

incorporate multiple perspectives need to be developed. Parenting practices could be measured from the adolescent's perspective, the perspective of each parent, and the perspective of a teacher or family friend. Adolescent competence and behaviors could be measured using reports from peers, parents, and teachers as well as from the adolescent. Development of these measures would permit the research to address the consistency and divergence between adolescent and parent perceptions. In addition, the study would permit (1) a comparison of parenting dimensions and parent types developed using adolescent perceptions with those using multiple indicators of parenting practices and (2) a determination of whether adolescent perceptions of parents or a combination of multiple perspectives are better predictors of adolescent behaviors and outcomes.

Additional research is also needed to understand the reciprocal character of parent-adolescent interactions. A longitudinal study would aid in determining the extent to which adolescents react to changes in parenting behaviors and the extent to which parenting practices are responsive to adolescent behaviors. Among the areas that should be addressed are whether parent-adolescent interactions form a reinforcing feed back loop where supportive parenting leads to positive adolescent outcomes which lead to further supportive parenting and increased positive outcomes. Alternatively, unsupportive parenting may lead to poor adolescent outcomes and reinforce continued unsupportive parenting which leads to even poorer outcomes.

Other important research questions include: Is there some steady state condition at which parental responses and adolescent behaviors are relatively predictable? Under

what conditions does that steady state change? Do parents change their standard (steady state) response when confronted with a single deviation from expected adolescent behavior, or are parenting responses contingent upon a pattern of deviations from expected behavior? Are parenting practices modified when adolescent competence falls below some acceptable threshold, or when problem behaviors increase above some threshold? These are all issues that could best be addressed through a longitudinal study.

Another potentially fruitful area of research would involve a determination of the extent to which the set of parenting dimensions and resulting parenting types change in accordance with the developmental level of the adolescent. For example, as adolescents become more developmentally advanced there may be relatively greater need for autonomy support and less need for structure and monitoring. Similarly, the permissive parent type may be associated with better outcomes for more developmentally advanced adolescents. The needed characteristics for a longitudinal study to address these issues follow the discussion of mesosystem research.

Mesosystem research. Although parents have substantial influence on adolescents, the influence of peers increases substantially during adolescence (Brown et al., 1993). In addition, adolescents spend increasing amounts of time in activities outside of the family. Interactions with peers, neighborhood, school, and community may make substantial contributions to adolescents' experiences of warmth, structure, autonomy support, rejection, chaos, and coercion. Research is needed to determine whether warmth, structure, and autonomy support provided in contexts other than the

family can compensate for deficits in family environments. This research should also address the extent to which warmth, structure, autonomy support, rejection, chaos, and coercion experienced in contexts outside the family contribute to adolescent feelings of relatedness, competence, and autonomy and subsequent adolescent competence and problem behaviors. These issues would also be best addressed in a longitudinal study which would permit an examination of temporal relationships among these variables. For example, if parents do not meet adolescents' needs, are adolescents more likely to seek supportive peers and teachers?

The longitudinal study should be designed to assess the dynamics of the parent-adolescent interactions and the context in which these interactions occur.

Characteristics of adolescent-school, adolescent-peer, and adolescent-community relationships should also be collected. The study should have at least these characteristics:

- 1) Multiple perspectives of parenting practices and adolescent behaviors should be included.
- 2) Data collection should be sufficiently frequent to assess the causal direction of relationships.
- 3) The study should occur over a sufficiently long period of adolescence to encompass developmental change.
- 4) The study should include assessments of the extent to which multiple contexts (family, school, peers, and community) may contribute to adolescent competence.

Exosystem. Additional research efforts should also focus on exosystem influences on the adolescent. If preventive interventions are to include changing parenting practices in an attempt to influence adolescent behaviors, it is necessary to understand the environments within which parents function. Factors which need to be understood include the influence of parents' work on parent-child relationships, sources of stress (e.g., job, financial, marital), and parent perceptions of the roles of school and community with regard to adolescent risk-taking behaviors.

A number of areas for future study have been outlined above. The overarching goal of these areas of study would be to create a theoretical structure sufficient to design intervention approaches to reduce detrimental adolescent risk-taking behaviors and promote healthy adolescent development. It has been suggested that adolescents engage in risk-taking behaviors to meet basic psychological needs. To the extent that these basic psychological needs for relatedness, competence, and autonomy can be met through interactions with peers, school, and community, there may be less need for detrimental risky behaviors.

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Appendix A

Parent Items

Warmth: $\alpha = .90$

1. My parents let me know they love me.
2. My parents are glad I am their child.
3. My parents enjoy being with me.
4. My parents are always glad to see me.
5. My parents think I'm special.
6. My parents are happy with me just the way I am.
7. My parents can tell how I'm feeling without asking.
8. My parents understand me very well.

Rejection: $\alpha = .88$

9. Sometimes I wonder if my parents like me.
10. My parents do not really love me.
11. My parents think I'm always in the way.
12. My parents don't say much about the good things I do, but they are always talking about the bad.
13. My parents make me feel like I'm not wanted.
14. When I am upset, my parents don't care.
15. Nothing I do is good enough for my parents.
16. My parents pick on me for every little thing.

Structure: $\alpha = .85$

17. When I want to do something, my parents show me how.
18. When I want to understand how something works, my parents explain it to me.
19. If I ever have a problem, my parents help me to figure out what to do about it.
20. My parents show me how to do things for myself.
21. My parents expect me to follow our family rules.
22. My parents explain the reasons for our family rules.
23. My parents keep their promises.
24. When my parents tell me they'll do something, I know they will do it.

Chaos: $\alpha = .83$

25. When my parents make a promise, I don't know if they will keep it.
26. When my parents say they will do something, sometimes they don't really do it.
27. When I do something wrong, I never know how my parents will react.
28. My parents keep changing the rules on me.
29. My parents get mad at me with no warning.
30. My parents punish me for no reason.
31. A lot of times, I don't know where my parents are.
32. I never know what my parents will do next.

Autonomy Support: $\alpha = .87$

33. My parents trust me.
34. My parents accept me for myself.
35. My parents let me do the things I think are important.
36. My parents encourage me to be true to myself.
37. My parents expect me to say what I think.
38. My parents try to understand my point of view.
39. When my parents ask me to do something, they explain why.
40. My parents want to know what I think about how we should do things.

Coercion: $\alpha = .86$

41. My parents are always telling me what to do.
42. My parents boss me.
43. My parents try to control everything I do.
44. My parents think there is only one right way to do things--their way.
45. The only reason my parents give is "Because I said so."
46. My parents say "no" to everything.
47. I'm not allowed to disagree with my parents.
48. My parents think that they know best about everything.

Appendix B

Revised Parent Items

Warmth: $\alpha = .88$

- F21. My parents let me know they love me.
- F12. My parents are glad I am their child.
- F14. My parents enjoy being with me.
- F7. My parents are always glad to see me.

Rejection: $\alpha = .80$

- F29. Sometimes I wonder if my parents like me.
- F34. My parents do not really love me.
- F16. My parents think I'm always in the way.
- F39. My parents make me feel like I'm not wanted.

Structure: $\alpha = .77$

- F37. When I want to do something, my parents show me how.
- F9. If I ever have a problem my parents help me to figure out what to do about it.
- F19. My parents show me how to do things for myself.
- F15. My parents explain the reasons for our family rules.

Chaos: $\alpha = .71$

- F22. When my parents make a promise, I don't know if they will keep it.
- F38. When my parents say they will do something, sometimes they don't really do it.
- F11. I never know what my parents will do next.
- F25. A lot of times, I don't know where my parents are.

Autonomy Support: $\alpha = .84$

- F35. My parents trust me.
- F44. My parents accept me for myself.
- F40. My parents encourage me to be true to myself.
- F50. My parents try to understand my point of view.

Coercion: $\alpha = .80$

- F27. My parents are always telling me what to do.
- F51. My parents boss me.
- F52. My parents think there is only one right way to do things—their way.
- F49. My parents say "no" to everything.

Appendix C

Risk Factors

Low neighborhood attachment ($\alpha = .74$)

1. I'd like to get out of my neighborhood. (0 - Definitely not true, 1 - Not true, 2 - True, 3 - Definitely true)
2. I like my neighborhood. (0 - Definitely true, 1 - True, 2 - Not true, 3 - Definitely not true)
3. If I had to move, I would miss the neighborhood I now live in. (0 - Definitely not true, 1 - Not true, 2 - True, 3 - Definitely true)

Community disorganization ($\alpha = .82$)

1. How much do each of the following statements describe your neighborhood:
(0 - Definitely not true, 1 - Not true, 2 - True, 3 - Definitely true)

Crime and/or drug selling.

Fights.

Lots of empty or abandoned buildings.

Lots of graffiti.

2. I feel safe in my neighborhood. (0 - Definitely true, 1 - True, 2 - Not true, 3 - Definitely not true)

Transitions and mobility ($\alpha = .67$)

1. Have you changed homes in the past year? (0 - No, 1 - Yes)
2. How many times have you changed homes since kindergarten?
(0 - Never, 1-2 times, 3-4 times, 5-6 times, 7 or more times)
3. Have you changed schools in the past year? (0 - No, 1 - Yes)
4. How many times have you changed schools since kindergarten?
(0 - Never, 1-2 times, 3-4 times, 5-6 times, 7 or more times)
5. People move in and out of my neighborhood a lot.
(0 - Definitely not true, 1 - Not true, 2 - True, 3 - Definitely true)

Perceived availability of drugs and handguns ($\alpha = .87$)

1. If you wanted to get some beer, wine, or hard liquor (for example, vodka whiskey, or gin), how easy would it be for you to get some?
(0 - Very hard, 1 - Sort of hard, 2 - Sort of easy, 3 - Very easy)
2. If you wanted to get some cigarettes, how easy would it be for you to get some?
(0 - Very hard, 1 - Sort of hard, 2 - Sort of easy, 3 - Very easy)
3. If you wanted to get some marijuana, how easy would it be for you to get some?
(0 - Very hard, 1 - Sort of hard, 2 - Sort of easy, 3 - Very easy)
4. If you wanted to get a drug like cocaine LSD, or amphetamines, how easy would it be for you to get some?
(0 - Very hard, 1 - Sort of hard, 2 - Sort of easy, 3 - Very easy)
5. If you wanted to get a handgun, how easy would it be for you to get one?
(0 - Very hard, 1 - Sort of hard, 2 - Sort of easy, 3 - Very easy)

Norms favorable for drug use ($\alpha = .89$)

1. How wrong would most adults in your neighborhood think it was for kids your age:
(0 - Very wrong, 1 - Wrong, 2 - A little bit wrong, 3 - Not wrong at all)

to use marijuana?
to drink alcohol?
to smoke cigarettes?

Adult models for delinquent behavior ($\alpha = .87$)

1. About how many adults have you know personally who in the past year have:
(0 - None, 1 adult, 2 adults, 3 or 4 adults, 5 or more adults)

used marijuana, crack, cocaine, or other drugs?
sold or dealt drugs?
done other things that could get them in trouble with the police like stealing, selling stolen goods, mugging or assaulting others, etc.?
gotten drunk or high?

Low likelihood of getting caught ($\alpha = .83$)

1. If a kid drank some beer, wine or hard liquor (for example vodka, whiskey, or gin) in your neighborhood he or she would be caught by the police.
(0 - Definitely true, 1 - Mostly true, 2 - Mostly not true, 3 - Definitely not true)
2. If a kid smoked marijuana in your neighborhood he or she would be caught by the police.
(0 - Definitely true, 1 - Mostly true, 2 - Mostly not true, 3 - Definitely not true)
3. If a kid carried a handgun in your neighborhood he or she would be caught by the police.
(0 - Definitely true, 1 - Mostly true, 2 - Mostly not true, 3 - Definitely not true)

Parental acceptance of drug use ($\alpha = .79$)

1. How wrong do your parents feel it would be for you to:
(0 - Very wrong, 1 - Wrong, 2 - A little bit wrong, 3 - Not wrong at all)
 - a. drink beer, wine or hard liquor (for example, vodka, whiskey or gin) regularly?
 - b. smoke cigarettes?
 - c. smoke marijuana?

Parental acceptance of delinquent behavior ($\alpha = .72$)

1. How wrong do your parents feel it would be for you to:
(0 - Very wrong, 1 - Wrong, 2 - A little bit wrong, 3 - Not wrong at all)
 - a. steal anything worth more than \$5?
 - b. draw graffiti, or write things or draw pictures on buildings or other property (without the owner's permission)?
 - c. pick a fight with someone?

Interaction with antisocial peers ($\alpha = .90$)

1. Think of your four best friends (the friends you feel closest to). In the past year (12 months), how many of your best friends have:
(0 - None, 1, 2, 3, 4)
 - a. been suspended from school?
 - b. carried a handgun?
 - c. sold illegal drugs?
 - d. stolen or tried to steal a motor vehicle such as a car or motorcycle?

- e. been arrested?
- f. dropped out of school?
- g. been members of a gang?

Friends' use of drugs ($\alpha = .83$)

1. Think of your four best friends (the friends you feel closest to). In the past year (12 months), how many of your best friends have:
(0 - None, 1, 2, 3, 4)
 - a. smoked cigarettes?
 - b. tried beer, wine, or hard liquor (for example, vodka, whiskey, or gin) when their parents didn't know about it?
 - c. used marijuana?
 - d. used LSD, cocaine, amphetamines, or other illegal drugs?

Rewards for antisocial involvement ($\alpha = .85$)

15. What are the chances you would be seen as cool if you:
(1 - No or very little chance, 2 - Little chance, 3 - Some chance, 4 - Pretty good chance, 5 - Very good chance)
 - a. smoked cigarettes?
 - b. began drinking alcoholic beverages regularly, that is, at least once or twice a month?
 - c. smoked marijuana?
 - d. carried a handgun?

Lack of rewards for conventional involvement ($\alpha = .88$)

1. My neighbors notice when I am doing a good job and let me know.
(0 - Definitely true, 1 - Mostly true, 2 - Mostly not true, 3 - Definitely not true)
2. There are people in my neighborhood who encourage me to do my best.
(0 - Definitely true, 1 - Mostly true, 2 - Mostly not true, 3 - Definitely not true)
3. There are people in my neighborhood who are proud of me when I do something well.
(0 - Definitely true, 1 - Mostly true, 2 - Mostly not true, 3 - Definitely not true)

Appendix D

Subscales from the Self-Perception Profile for Adolescents (Harter, 1988)

A. Scholastic competence

Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
☐	☐	Some teenagers feel that they are just as smart as others their age	BUT	Other teenagers aren't so sure and wonder if they are as smart.	☐	☐
☐	☐	Some teenagers are pretty slow in finishing their school work	BUT	Other teenagers can do their school work more quickly.	☐	☐
☐	☐	Some teenagers do very well at their classwork	BUT	Other teenagers don't do very well at their classwork.	☐	☐
☐	☐	Some teenagers have trouble figuring out the answers in school	BUT	Other teenagers almost always can figure out the answers.	☐	☐
☐	☐	Some teenagers feel that they are pretty intelligent	BUT	Other teenagers question whether they are intelligent.	☐	☐

 $\alpha = .77$

B. Social acceptance

Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
☐	☐	Some teenagers find it hard to make friends	BUT	For other teenagers it's pretty easy.	☐	☐
☐	☐	Some teenagers have a lot of friends	BUT	Other teenagers don't have very many friends.	☐	☐
☐	☐	Some teenagers are kind of hard to like	BUT	Other teenagers are really easy to like.	☐	☐

☐	☐	Some teenagers are popular with others their age	BUT	Other teenagers are not very popular.	☐	☐
☐	☐	Some teenagers feel that they are socially accepted	BUT	Other teenagers wish that more people their age accepted them.	☐	☐

$\alpha = .80$

C. Global self-worth

Really True for Me	Sort of True for Me				Sort of True for Me	Really True for Me
☐	☐	Some teenagers are often disappointed with themselves	BUT	Other teenagers are pretty pleased with themselves.	☐	☐
☐	☐	Some teenagers don't like the way they are leading their life	BUT	Other teenagers do like the way they are leading their life.	☐	☐
☐	☐	Some teenagers are happy with themselves most of the time	BUT	Other teenagers are often not happy with themselves.	☐	☐
☐	☐	Some teenagers like the kind of person they are	BUT	Other teenagers often wish they were someone else.	☐	☐
☐	☐	Some teenagers are very happy being the way they are	BUT	Other teenagers wish they were different.	☐	☐

$\alpha = .83$

Appendix E

Commitment to School

Commitment to school ($\alpha = .76$)

1. How often do you feel that the school work you are assigned is meaningful and important? (1 - Almost always, 2 - Often, 3 - Sometimes, 4 - Seldom, 5 - Never)
2. How interesting are most of your courses to you? (1 - Very interesting and Stimulating, 2 - Quite interesting, 3 - Fairly interesting, 4 - Slightly dull, 5 - Very dull)
3. How important do you think the things you are learning in school are going to be for your later life? (1 - Very important, 2 - Quite important, 3 - Fairly important, 4 - Slightly important, 5 - Not at all important)
4. Now thinking back over the past year in school, how often did you . . .
 - a. Enjoy being in school (1 - Almost always, 2 - Often, 3 - Sometimes, 4 - Seldom, 5 - Never)
 - b. Hate being in school?
 - c. Try to do your best work in school

Appendix G

Interactions

Figure G1
Predicting Academic Competence
Autonomy Support by Chaos Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G2
Predicting Commitment to School
Autonomy Support by Chaos Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G3
Predicting Social Competence
Autonomy Support by Chaos Interaction: Girls*

*Graphed at $\pm$ one standard deviations from their means.

Figure G4
Predicting Social Competence
Autonomy Support by Chaos Interaction: Boys*

*Graphed at $\pm$ one standard deviations from their means.

Figure G5
Predicting Self-Worth
Autonomy Support by Chaos Interaction: Girls*

*Graphed at $\pm$ one standard deviations from their means.

Figure G6
Predicting Self-Worth
Autonomy Support by Chaos Interaction: Boys*

*Graphed at $\pm$ one standard deviations from their means.

Figure G7
Predicting Mastery
Autonomy Support by Chaos Interaction: Girls*

*Graphed at $\pm$ one standard deviations from their means.

Figure G8
Predicting Mastery
Autonomy Support by Chaos Interaction: Boys*

*Graphed at $\pm$ one standard deviations from their means.

Figure G9
Predicting Overall Competence
Autonomy Support by Chaos Interaction: Girls*

*Graphed at $\pm$ one standard deviations from their means.

Figure G10
Predicting Overall Competence
Autonomy Support by Chaos Interaction: Boys*

*Graphed at $\pm$ one standard deviations from their means.

Figure G11
Predicting Substance Use
Rejection by Gender Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G12
Predicting Substance Use
Warmth by Coercion Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G13
Predicting Substance Use
Structure by Coercion Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G14
Predicting Problem Behaviors
Warmth by Gender Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G15
Predicting Problem Behaviors
Structure by Coercion Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G16
Predicting Problem Behaviors
Monitoring by Coercion Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G17
Predicting Overall Problem Behaviors
Warmth by Coercion Interaction: Girls*

*Graphed at $\pm$ one standard deviations from their means.

Figure G18
Predicting Overall Problem Behaviors
Warmth by Coercion Interaction: Boys*

*Graphed at $\pm$ one standard deviations from their means.

Figure G19
Predicting Overall Problem Behaviors
Structure by Coercion Interaction*

*Graphed at $\pm$ one standard deviations from their means.

Figure G20
Predicting Overall Problem Behaviors
Monitoring by Coercion Interaction*

*Graphed at $\pm$ one standard deviations from their means.