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Parents and Peers: Understanding Direct and Indirect Effects on Adolescent Marijuana Use

by

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DEDICATION

This thesis is dedicated to my best friend – my husband – whose kindness, love, support, laughter, and friendship throughout, was pivotal in helping me cross the finish line.

Abstract

To better understand the relationship of parent and peer factors in contributing to adolescent marijuana use, the present study investigated the direct and indirect effects of perceived parental knowledge and best friend drug use on adolescent marijuana use. Survey responses from 2552 grade 10, 11, and 12 students were used to explore these relationships. As expected, perceived parental knowledge had significant negative relationships with marijuana use and best friend use and best friend use had a significant positive relationship with marijuana use. As expected, males reported more marijuana use and more best friend use than did females. Yet females reported higher levels of perceived parental knowledge than males. Logistic regression revealed that best friend use partially mediated the relationship between perceived parental knowledge and marijuana use. Contrary to expectations, the mediation relationship was the same for males and females. Implications of the findings for the mediation model are discussed.

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In 2005, the Alberta Alcohol and Drug Abuse Commission (AADAC) reported that one quarter (27%) of youth in the province had used marijuana in the past year and that a third (32%) had used marijuana in their lifetime (Wild, Wolfe, & Currie, 2006). The prevalence of marijuana use during adolescence seems to be a widespread occurrence within North America, suggesting marijuana to be adolescent's number one choice of drug (Dodge et al., 2009). This is problematic because of potential health risks to the adolescent (e.g., respiratory problems, lung damage, depression) and the costs to society for treating subsequent marijuana addiction (AADAC, 2004; Bogenschneider, Wu, Raffaelli, & Tsay, 1998). Marijuana use in adolescence is of particular interest because it is when youth are most likely to initiate substance use (McCord, 1990) and because it is when youth become more peer oriented, relying less on parents for advice and guidance (Bogenschneider et al., 1998). In order to understand what contributes to marijuana use, the theory of ecological development suggests that researchers examine the proximal influences – family and peers – in an adolescent's life; these influences have been found to be the most important in understanding deviant behaviour (Darling, 2007). The present study aims to delineate how parents and peers uniquely influence adolescent marijuana use by attempting to highlight their indirect and direct influences.

Within the area of family context, the literature has focused mainly on the links between parents' level of monitoring (parents active efforts on knowing their adolescent's whereabouts, activities, and friends) and its impact on adolescent marijuana use (Lac & Crano, 2009). Recently however, the literature has shifted away from focusing on parental monitoring, pointing instead to the level of parental knowledge about adolescents whereabouts and activities as the most important factor in predicting norm-breaking behaviour (Kerr, Stattin, & Burk, 2010). In

particular— the more information adolescents believe their parents have about their time outside of the home, the less likely they are to engage in substance use (Laird, Pettit, Bates, & Dodge, 2003).

Within the area of peer relationships, literature suggests that peers have a significant influence on adolescent's initiation of drug use. Although adolescents who associate with substance using peers generally have easier access to substances and are more likely to face pressure from their peers to try substances (Bogenschneider et al., 1998), it is a best friend's use of drugs that is the most significant predictor of an adolescent's own use of marijuana (Barnes, Farrell, & Banerjee, 1994).

As Bronfenbrenner predicted however, the studies that have focused on peer and parent factors have found both contexts to be predictive of adolescent's engagement in drugs and/or alcohol (Bogenschneider et al., 1998; Dishion, Capaldi, & Yoerger, 1999). These findings highlight that it is unwise to claim that one context has more influence than the other; it is counter-productive to focus research energies on one influence as it may detract from the interacting and dynamic nature of each context and their unique contributions to adolescent drug use (Dodge et al., 2009). Therefore, the goal of the current study is to examine the direct and indirect effects of parenting (i.e., perceived parental knowledge) and peer relationships (i.e., best friend's drug use) on adolescent marijuana use. Moreover, it will explore whether or not these relationships are the same for both males and females.

Bronfenbrenner's Theory of Human Ecological Development and Adolescence

Bronfenbrenner's (1977) theory of human ecological development suggests that an individual's growth is influenced primarily by the norms, roles, and people that make up their surrounding environments. These environments are described as four nested systems which

enclose one another, placing the developing person at its centre (Mcmillan, 1990); they are the microsystem, the mesosystem, the exosystem, and the macrosystem (Bronfenbrenner, 1977). All four systems, along with the individual, change and develop as a function of time and space and are governed by the multiple social contexts, formal (e.g., school system) and informal (e.g., family), found within each system (Bronfenbrenner, 1977). According to Bronfenbrenner, behaviour can only be understood as a function of the person's environments and the interactions and connectedness between and within these systems (Darling, 2007).

The theory of human ecological development proposes that studies of adolescent behaviour are best understood as part of the contextual, cultural, and historical fabric of which they are a part (Darling, 2007). The transition out of childhood (e.g., family context) and into adolescence (e.g., peer context) exemplifies the major tenet of the theory that suggests change is brought about by transitions between settings and the adolescent's accommodation of the new roles, activities, and relationships that emerge as a result. This notion is supported by research that has found the adolescent's proximal influence to have a significant impact on the adolescent's development of both prosocial (Hair, Moore, Garret, Ling, &Cleveland, 2008; Pardeck & Pardeck, 1990) and antisocial behaviour (Bahr, Maughan, Marcus, & Li, 1998; Chilcoat & Anthony, 1996; Kandel & Andrew, 1987; Reitz, Prinzie, Dekovic, & Buist, 2007).

The Microsytem and Adolescent Drug Use

The immediate setting in which an individual primarily participates is described as his or her microsystem (Bronfenbrenner, 1977). The microsystem can be made up of multiple settings such as home, school, and work. Each setting is characterized by significant relationships between the adolescent and a small group of individuals as well as expectations of behaviours that are congruent with the roles members take within each setting (Bronfenbrenner, 1977). For

the developing adolescent, their primary relationships, and therefore, their most proximal influences, are believed to be their parents (e.g., the family microsystem) and their friends (e.g., the peer microsystem) (Muus, 1996). The relationships fostered in these settings are intimate, interpersonal, and enduring in nature and standards of behaviour require adolescents to participate in joint activities that emphasize their roles in each context (Muus, 1996).

Of all the systems proposed, the microsystem has been the most researched in terms of identifying factors that predict the development of adolescent deviant behaviours such as drug use. Parenting factors, such as rearing practices (Barnes & Farrell, 1992), quality of the parent-adolescent relationship (e.g., support, bonding) (Anderson & Henry, 1994), and parental knowledge (Stattin & Kerr, 2000) have been found to be significantly related to adolescent substance use (e.g., drug use) and norm-breaking behaviour (e.g., marijuana use). Research has also pinpointed peer factors, such as peer drug use, as highly predictive of adolescent's own level of drug use (Bahr et al., 1998).

The Mesosystem and Adolescent Drug Use

The key defining factor of the mesosytem is the occurrence of interactions and interrelationships between multiple microsystems that require the adolescent to transition between the varying roles they play within each context (Bronfenbrenner, 1977; Muus, 1996). Transitioning in and out of each system requires the adolescent to accommodate and function in different roles as daughter/son, friend, and group member and to engage in activities and behaviours that do not always translate easily to each context (Muus, 1996). These system interactions are pertinent to adolescent development as changes in one system results in changes to the other (Bronfenbrenner, 1977).

Research has documented the impact of a negative mesosystem on adolescent development as a result of poor interactions within microsystems. For example, findings have shown that poor parenting practices (i.e., family microsystem) have a direct influence on adolescent's engagement with drug using peers (i.e., peer microsystem) (Maltzman & Schweiger, 1991) while drug using peers have been found to increase the risk of adolescent's engagement in drug use (Ary, Duncan, Duncan, & Hops, 1999; Bahr, Hoffman, & Yang, 2005). Thus, adolescent drug use can be hypothesized as the consequence of the interactions between the family and peer microsystems (i.e., the mesosytem) implicating the microsystem as possessing tremendous influence on adolescent's use of drugs (Mcmillan, 1990).

The Exosystem and Adolescent Drug Use

The society the adolescent belongs to has systems and processes in place which inform their behaviours as well as the behaviours of the people within their microsystems. These same processes also serve to inform how individuals from each microsystem are supposed to interact with each other. This larger environment is referred to as the exosystem which includes factors such as cultural background, peer group, and family structure; distal variables that still have an impact on an adolescent's development (Mcmillan, 1990). The effect of family structure on adolescent development for instance, can be a result of the lack of resources that can be put forth to meet certain societal expectations of adolescents' needs, preferences, and extracurricular activities. In particular, adolescents who live in one parent households do not benefit from the resources (i.e., time and financial) that adolescents living in two parent households may have access to. Findings have indicated this exosystem influence to be important in drug use behaviours; specifically, adolescents living in two parent households – and more specifically,

with their biological parents – have lower risk of using drugs than adolescents from single parent homes (Hoffman & Johnson, 1998).

Other distal factors that can impact the adolescent's development may include the adolescent's neighbourhood. Neighbourhoods have varying resources; thus, the activities or assistance available to the adolescent and their community can be limited which can result in negative consequences for the adolescent (Darling, 2007). For instance, previous research has cited that the presence of social disorganizaiton and crime increased the risk of adolescents engaging in delinquent behaviour including the use of illegal substances (Lahey, Van Hulle, D'Onforio, Rodgers, & Waldman, 2008). Although these variables exert influence on an adolescent's life by enriching or impinging his or her development, these distal variables are largely out of the adolescent's or their families' immediate control (Bronfenbrenner, 1977; Mcmillan, 1990)

The Macrosystem and Adolescent Drug Use

The macrosystem is governed by society's general social and/or cultural beliefs, laws, and policies that dictate the structural components (e.g., behaviours, activities, roles, norms) that are manifested in the micro-,meso-, and exo- systems (Mcmillan, 1990). For instance, the stage of adolescence is a societal construction that delineates which ages are to be included (Mcmillan, 1990). As a result, categories of people as children, adolescents, or adults emerge and society provides each category their own set of structural components which inform their behaviour and expectations of self and of others (Muus, 1996). Bronfenbrenner (1977) believes that the macrosystem is made up of the legal, social, economical, and education systems which then produce the adolescent's micro-, meso-, and exo-sytems. Thus, the macrosystem creates 'blueprints' of how adolescents should act, what they should do, and who they should associate

with (Bronfenbrenner, 1977). For example, adolescents who act in accordance with the 'druggie peer group blueprint' is *expected* to associate with other drug using peers and use drugs themselves (Brown, Mounts, Lamborn, & Steinberg, 1993). Additionally, the legal and economical measures put in place by the macrosystem provide the laws of conduct regarding certain behaviour (Bronfenbrenner, 1977). As a result, the presence of laws regarding drug use will also have a distal impact on an adolescent's choice to associate with drug using peers and to use drugs themselves.

The Microsystem: Proximal Influences on Adolescent Drug Use

Although Bronfenbrenner (1977) claims that all systems are important in adolescent development, he argues that the proximal factors play the most significant role. The proximal factors in an adolescent's life are clearly their family and their peers; these are the individuals whose significant relationships, which are familiar and meaningful, are likely to exert the most influence on an adolescent's behaviour (Mcmillan, 1990). Research that has looked at meso-, exo-, and macro- system influences seem to always point to the relationships and interactions adolescents have with their parents or the relationships and interactions they have with their peers in relation to predicting the etiology of adolescent drug use; even the impact of distal influences on adolescent drug use can be attributed to how distal influences impact the atmosphere of the adolescent's microsystems. The role of parents and peers on adolescent development cannot be ignored and as a result, the direct and indirect effects of family and peer factors on adolescent marijuana use will need to be further explored.

The Family Context

Parents play a major role in the socialization of their adolescent, acting as guides through the stage of adolescence (Steinberg, 1990). The influence of the family is apparent; parents

providing a family context characterized by warmth, closeness, and cohesion have been found to foster the positive development of their adolescent's growing autonomy, self-esteem, identity, and self-worth (Bell & Bell, 2009; Hair et al., 2008; Pardeck & Pardeck, 1990). On the contrary, parents providing a family context characterized by conflict, neglect, and hostility have been linked to the adolescent's development of a negative sense of self, high levels of anxiety, emotional instability, (Barber, 1992; Tomori, 1994) and delinquent behaviours such as aggression and drug use (Barnes, Reifman, Farrell, & Dintcheff, 2000; Childs, Sullivan, & Gulledge, 2011). From the many different variables cited (e.g, support, warmth), parental monitoring – "a set of correlated parenting behaviors involving attention to and tracking of child's whereabouts, activities, and adaptation" (Dishion & McMahon, 1998, p. 65) – has surfaced as one of the most consistent and robust factors in predicting adolescent marijuana use (Bahr et al., 2005; Cottrell et al., 2003; Lac & Crano, 2009).

Recently, researchers have doubted the predictive power of parental monitoring because of the way it has been historically conceptualized. The controversy surrounding the definition of parental monitoring stems from the discrepancy between the behavioural aspect of monitoring as defined by Dishion and McMahon (1998) and the items used to create the measure. Kerr et al. (2010) have reported that the items used to measure monitoring are actually tapping into a different concept – parental knowledge; that is, parents' "knowledge of…youth's whereabouts, activities, and peers" (p.45). Additionally, Kerr et al. found no significant relationship between monitoring and knowledge, questioning the studies which have assumed monitoring efforts to produce higher levels of parental knowledge. Moreover, Kerr et al. have found that parental knowledge, investigated as its own construct, is more predictive of adolescent delinquent behaviour than parental monitoring. Kerr et al.'s findings suggest that monitoring and

knowledge are two distinct parenting constructs and therefore, must be conceptualized and measured as such. This critical but largely novel shift in the controversy between parental monitoring and knowledge makes it imperative for researchers to begin investigating accurately, the role of parents' knowledge – not monitoring – on adolescent delinquency and more specifically, on marijuana use.

The Role of Family in Adolescent Development

The stage of adolescence is a tricky time for parents as they struggle to find the balance of managing their adolescent's growing need for autonomy and continued need for dependency (Pardeck & Pardeck, 1990). Parents are called upon to realign roles and relationships between themselves and their adolescent; the parents' ability to successfully navigate this realignment has major consequences for the adolescent's development and adjustment (Steinberg, 1990). Part of the realignment process requires parents to balance their role between considering their adolescent's voice in decisions that impact their life (e.g., activities, friends, curfew) and continuing to provide their adolescent with guidance and support. The critical role of parents in an adolescent's development cannot be discounted as adolescents continue to depend on their parents for their basic needs (i.e., food, shelter, and clothing) and nurturance (i.e., warmth, support, guidance, involvement) (Pardeck & Pardeck, 1990). Researchers have found family factors such as socio-economic status, parental level of education, parenting style, and quality of parent-adolescent relationship to be important predictors of adolescent development and adjustment.

Socio-economic Status. Research has focused on the economic position of families in an effort to further determine its impact on adolescent development. Socio-economic status (SES), defined as parents' marital status, employment (type, level of pay), and level of education has

been linked to adolescent well-being (Crosnoe & Cavanagh, 2010). Of importance is the notion that belonging to lower SES does not itself constitute negative consequences for the adolescent; the consequences of SES are derived more specifically from the lack of opportunities families acquire as a result of their status. For instance, adolescents from low SES are more likely to have parents who have low levels of education compared to high SES families. Thus, the job choices parents from low SES are usually limited to employment that requires longer, non-standardized hours (e.g., shift work, nights) as well as lower rates of pay.

If single, divorced, or separated, a parent will often work multiple jobs in order to provide for their family. Inadvertently, family functioning can be impacted due to the decreased time parents are able to spend at home; opportunities for family connectedness, support, and cohesion and for parents' ability to guide, discipline, and reinforce 'good' behaviours of their growing adolescent decrease as well (Crosnoe & Cavanagh, 2010). This may explain findings that report associations between an adolescent's level of emotional intelligence to parents' level of education and household income (Harrod & Scheer, 2005). In fact, research has shown that adolescents whose parents are employed in better-paid jobs are more likely to exhibit higher levels of mental well-being and psychosocial functioning (Crosnoe & Cavanagh, 2010).

Given what is known about the impact of family on adolescent development, researchers have also turned their attention to examining whether family factors can be linked to adolescent's delinquency and substance use. Researchers have found some similarities between the factors that contribute to adolescent development and the factors that contribute to adolescent problem behaviours. It seems that the family has as much influence in their adolescent's uptake of anti-social behaviours as they do in their positive development.

Parenting Style. Baumrind (1966) developed three typologies that described parenting style and its impact on the adolescent. Parents who exhibit an authoritarian style are described as providing a rigid and restrictive home structure in which high levels of obedience are expected. A permissive parenting style on the other hand describes parents who are in favour of providing their adolescent with a home structure that is characterized by looseness, freedom, lack of rules, and ample room for negotiation. In the middle is the authoritative parenting style; these parents prefer a more democratic home environment that honours the adolescent's growing autonomy but does so in the context of a structure that sets reasonable expectations and responsibilities for all members of the family.

The authoritative parenting style has been found to be the most optimal for fostering positive adolescent adjustment as it balances the developmental needs of autonomy and individuation as well as parents' continued guidance and support (Pardeck & Pardeck, 1990). In contrast, adolescents who have authoritarian parents have less success in developing autonomy and are less likely to experience self-awareness and growth; those coming from permissive homes can be lead awry as they can detach from their parents and look to their peers for support and guidance (Pardeck & Pardeck, 1990).

Atmosphere of parent-adolescent relationship. Most of the conflict that occurs between a parent and their adolescent is about the mundane everyday nuances of the adolescent's life (e.g., curfew, friends, activities) and not the adolescent's desire to be free from or resentment towards their parents' authority, as is often represented in popular culture (Steinberg, 1990). When conflict about adolescent's choice of friends, activities, and requests do arise, conflict managed on the backdrop of a warm and positive relationship often bring positive consequences to the adolescent's development (e.g., teaching adolescent and parent about

communication, compromise, agreement) (Steinberg, 1990). It has been found that adolescents who experience their parents as empathetic, supportive, and involved, and perceive their relationship to be of high quality, report having higher levels of self-reliance, academic achievement, confidence, and mental well-being (Bell & Bell, 2009; Hair, et al., 2008). The presence of a warm and supportive home environment has lasting effects; adolescents who described their family as warm and cohesive reported having high levels of self-esteem and confidence in their abilities to form trusting relationships with others as adults (Bell & Bell, 2009).

In contrast, adolescents who viewed their parents as neglectful, controlling, distant, unloving, and unsafe have reported developmental difficulties such as emotional instability, aggression, destructiveness, anxiety, insecurity, low impulse control, and inability to manage stress and/or external/internal pressure (Tomori, 1994). Also, parents who exhibit high levels of psychological control (e.g., interfering with adolescent's development of autonomy, manipulation of adolescent's emotion to attain obedience) have been linked to adolescent's lack of social competence, self-esteem, and possession of internalized problems (Barber, 1992).

Family Factors and Adolescent Deviancy

Research suggests a direct relationship between parenting variables and adolescent delinquent behaviours. The construct of 'delinquency' includes a hybrid of problem behaviours; these behaviours are commonly understood to range from minor acts (e.g, skipping school) to more major offences (e.g, carrying a weapon, selling drugs, smoking, drinking) including both non-aggressive (e.g, stealing) and aggressive behaviours (e.g, beating someone up purposely) (Childs et al., 2011). Delinquency also includes substance use behaviours that include substances such as cigarettes, drugs, and alcohol (Duncan, Tildesley, Duncan, & Hops, 1995).

Attempts to understand how adolescents become delinquent suggest the family atmosphere and level of parent's efforts to control their adolescent's behaviours and activities to be significant contributors.

Parental control and supervision. Parents' level of control (Barber, 1992) and supervision (Murray & Farrington, 2010) have been found to contribute to adolescent delinquency. Setting appropriate levels of behavioural control can be a struggle as parents attempt to find a balance between providing rules and granting freedom. Some parents may become too permissive, decreasing their behavioural supervision (e.g, insufficient regulation, knowledge or surveillance of adolescent's behaviour) and levels of parental monitoring; factors that have been found to predict deviant behaviour (Barber, 1992; Pepler, Jiang, Craig, & Connolly, 2010). However, adolescents who report their parents exhibit extreme behavioural and psychological control also report higher levels of deviancy (Barnes, Farrell, & Cairns., 1986; Galambos, Barker, & Almeida, 2003). Adolescent's growing autonomy requires increased direction and guidance; parent's difficulty in continuing to provide their adolescent with rules, structure, and monitoring at a time when they need it most may be why poor supervision practices have been consistently linked to adolescent delinquency (Murray & Farrington, 2010).

Atmosphere of parent-adolescent relationship. The general quality of parent-adolescent interactions continues to have as great of an influence on adolescent delinquency as it does on adolescent development. Findings highlight adolescents' perception of their attachment to their parents (Childs et al., 2011) and their parents' level of support (Barber, 1992; Eichelscheim et al., 2010) as significant factors in lowering risk for adolescent's engagement in delinquent behaviour. On the other hand, the presence of unhealthy conflict and antagonism in the parent-adolescent relationship (Eichelscheim et al., 2010) as well as exposure to parental

discord (Murray & Farrington, 2010), has been found to be associated with higher levels of aggression and delinquency. Also, adolescents who experience maltreatment at the hand of their parents (e.g, physical punishment, withdrawal of love, absence of support, emotional abuse, etc.) are more likely to show incremental levels of delinquent behaviour compared to adolescents who do not report experiencing maltreatment (Hollist, Hughes, & Schaible, 2009).

Gender differences. Usually, males have been found to engage in more delinquent behaviours than females (Hollist et al., 2009). Some evidence suggests that the effects of the parent-adolescent relationship on adolescent delinquency may impact males and females differently. For example, Fagan, Van Horn, Hawkins, and Arthurs (2007), report that the differences between levels of delinquency were due to males experiencing a higher exposure to risk and lower exposure to protection (e.g, prosocial opportunities, attachment to mother and father, family conflict-pro-delinquency, pro-substance use, family management) within their family environment. These findings highlight the importance of conducting analyses regarding delinquent behaviour for males and females separately.

Family Factors and Adolescent Substance Use

It is suggested that the delinquent behaviour adolescents are at most risk for is substance use (Dodge et al., 2009). The broad way that delinquency is defined makes it unwise to assume that variables related to delinquency are as potent in predicting substance use. Examining the research that focuses on adolescent substance use as the dependent variable helps highlight which family factors predict it and whether or not these factors are similar to or different from those associated with delinquent behaviour overall.

Adolescent's engagement with substance use (i.e., alcohol, drugs, marijuana) can often signal a downward trajectory that results in mental, physical, economical, and social costs to the

adolescent (Petraitis, Flay, & Miller, 1995). Research has pointed to parents' attitudes and endorsement towards substance use (Latendrese, Rose, Viken, Pulkkinen, Kaprio, & Dick, 2008), parent-adolescent relationship (e.g, quality, support, communication, conflict) (Anderson & Henry, 1994), as well as parents' rearing practices (e.g., control, discipline, monitoring) (Bahr et al., 1998; Barnes et al., 2000; Barnes, Farrell, & Cairns, 1986) as important variables to consider in adolescent substance use development. Researchers have also investigated the role of gender as findings suggest males exhibit higher levels of substance use than females (Anderson & Henry, 1994; Barnes et al., 2000; Stephenson & Henry, 1996).

Parents' substance use. Parents' use of substances has been shown to be highly predictive of adolescent's own substance use. Findings suggest that adolescents whose parents use substances often endorse similar substances themselves (Latendresse et al., 2008; Wills & Yaeger, 2003). Parents' attitude towards and use of substances are thought to be transmitted to the adolescent through the socialization role parents play in their adolescent's life; adolescent's may emulate parents' behaviours due to their perception that the behaviour is a positive choice, especially if that parent is held in high regard (Petraitis et al., 1995). Such behaviour may relay to the adolescent that substance use is an adaptive way to cope with life stressors (Jurich, Polson, Jurich, & Bates, 1985; Stephenson & Henry, 1996; Vakalahi, 2001) which may also explain why research has found adolescent's drinking patterns to reflect the drinking patterns of their parents (Al-Kandari, Yacoub, & Omu, 2001; Barnes et al., 1986; Denton & Kampfe, 1994; Kilpatrick, Acieron, Saunders, Resnick, Best, & Schnurr, 2000). Vakalahi (2001) suggests that adolescents who witness their parents' use of substances as a way of coping are at an increased risk to rely on substances in order to get them through their own difficult situations.

Parent-adolescent relationship. The parent-adolescent relationship continues to have predictive value over other aspects of the adolescent's life. For example, findings suggest that adolescents who perceived their families as cohesive and close and who describe their parents as highly supportive, warm, accepting, flexible, and open to communication, have a lower risk of using substances compared to their peers who viewed their families and parents in a much more negative light (Anderson & Henry, 1994; Barnes et al., 2000). The presence of a nurturing relationship between parent and adolescent seem to serve a protective factor; findings have showcased that both mothers and fathers play an important role in protecting their adolescents from engaging in substance use (Barnes et al., 1986; Childs et al., 2011). For instance, close relationships with fathers and receiving guidance from mothers have been reported as factors which deter adolescents from using substances (Coombs & Landsverk, 1988). The role of parental support – found to be important in adolescent development and in adolescent delinquency – has also been cited to protect adolescents from substance use (Barber, 1992). On the contrary, high levels of conflict characterized by negativity and criticism between the parent and adolescent increase the likelihood adolescents will use substances (Wills & Yaeger, 2008). In fact, adolescents who abused drugs have often described their parents as absent from their lives and their home environments as neglectful and hostile (Jurich et al., 1985).

Parental control and supervision. The level of control, supervision, and overall monitoring parents exert seem to have a significant influence on adolescent substance use. Adolescents who report that their parents use coercive control (e.g., slaps/hits) express the highest levels of substance use (Barnes & Farrell, 1992). These findings are substantiated by research that has found a significant relationship between adolescent drug use and greater parental control, rules and procedures (Maltzman & Schweiger, 1991). It would seem that high

levels of control and restrictions exacerbate adolescent substance use especially when experienced in the absence of cohesion, warmth, and support (Barnes et al., 1986; Maltzman & Schweiger, 1991).

Similar to the literature on adolescent deviancy, parental monitoring has been found to be the most consistent factor in predicting adolescent substance use. Findings have highlighted that as parental monitoring decreases, adolescent substance use increases (Bahr et al., 1998; Barnes, Farrell, Banerjee, 1994; Claes, Lacourse, Ercolani, Pierro, Leone, & Presaghi, 2005). Furthermore, Barnes, Reifman, Farrell, and Dintcheff (2000) found that parental monitoring protected adolescents from using alcohol initially and deterred increased use over time. Nonetheless, high levels of supervision in combination with high levels of parental authority and demands have been linked to rebellion (Baumrind, 1966); thus, the effectiveness of monitoring requires parents to balance their demands by fostering a positive parent-adolescent relationship.

Gender differences. The differences between genders regarding substance use mostly come from the research surrounding control, supervision, and overall monitoring. For instance, females who use substances have reported that their families had less organization and structure but had higher levels of control when compared to males (Maltzman & Schweiger, 1991). Furthermore, higher levels of substance use by males compared to females, are often accompanied by males' reports of low levels of monitoring and higher levels of parent-negotiated unsupervised time (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003). It seems that parents are stricter with females than males when it comes to setting curfews and rules around their activities (Peters, 1994); as a result, males are exposed to higher levels of risk which may explain why they exhibit higher levels of substance use behaviours.

Parents' awareness of their child's whereabouts and activities is significant to both adolescent delinquency and adolescent substance use. Further examination and deconstruction of the substance use definition into type (e.g., drug, alcohol, tobacco) highlights monitoring to be the most significant predictor for drug use (Barnes & Farrell, 1992; Dodge et al., 2009). As such, a further examination of parental monitoring is warranted in order to further investigate its powerful and predictive effect on adolescent's use of drugs.

Parental Monitoring and Drug Use

Dodge et al. (2009) propose that studies separate out the typologies of substances because alcohol, drug, and tobacco use often have unique trajectories as well as varying social, emotional, and biological consequences (AADAC, 2004; Bogenschneider et al., 1998). Using a compounded definition of substance use may not capture each type's unique significant differences. Findings have reported that monitoring has not always been linked to tobacco use (Dishion et al., 1999); for drug use however, monitoring has been a consistent predictor (Bahr et al., 2005; Chilcoat & Anthony, 1996; Claes, et al., 2005). For example, adolescents who reported being more closely supervised and monitored by their parent, parents, or responsible caregiver during middle childhood were less likely to be involved in drugs (i.e., marijuana, cocaine, and/or inhalant drugs); these adolescents also showed at least a two year delay in onset compared to their low monitored peers (Chilcoat & Anthony, 1996). Even when other factors such as family history of alcohol abuse and socioeconomic status are considered, adolescents who report high levels of monitoring exhibit less drug use (Claes, et al., 2005) than adolescents who report low levels of monitoring.

To investigate the role of parental monitoring on adolescent drug use, Dodge et al. (2009) followed 585 families and a target adolescent from 6^{th} to 12^{th} grade; of these families, 74%

completed all waves of the study. During the 6th grade, mothers were asked to report on their parental monitoring by answering questions regarding their adolescent's activities, friends, and time outside of the home. Adolescents were asked to report their perceived parental level of monitoring when they were in the 7th grade by answering questions regarding how much their parents really knew about who their friends were, how they spent their money, where they were after school, and what they do with their free time. Substance use was measured by asking adolescents in their 7th, 10th, and 12th grade about their drug use activities. In their 7th grade, adolescents were asked about their past year use of marijuana and other drugs; in their 10th grade, adolescents were asked how often they used illegal drugs. Lastly, adolescents were asked to report if they huffed or inhaled two substances in the past 12 months, and whether they had smoked marijuana, tried cocaine, crack, LSD or heroin, or tried any other way to get high, when they were in the 12th grade.

The findings showed that parental monitoring significantly predicted onset of adolescent's illicit substance use. These results were found for both mother-reported and adolescent-reported parental monitoring. Furthermore, when high levels of monitoring were reported, a protective effect was seen; adolescents were less likely to use drugs when they experienced their parent as knowledgeable about their lives.

Gender differences. Inconsistencies exist in terms of gender differences as it relates to the effect of monitoring on drug use. Dodge et al. (2009) for instance, reported no gender differences found for levels of drug use and of levels of monitoring experienced. Svensson (2003) on the other hand found males to use marijuana at higher rates than females. Monitoring levels continued to show that females are more highly monitored than males (Barnes et al., 2000;

Reitz et al., 2007; Svensson, 2003) and similar to the literature on adolescent delinquency and substance use, this finding was related to higher levels of drug use by males.

Parental Monitoring and Marijuana Use

Looking at the literature on adolescent drug use helps highlight its unique relationship to parenting factors. As a result, it is suggested that drug use be compartmentalized further especially since research has found that each type of drug (e.g., marijuana, cocaine, heroin) has a unique trajectory (Dodge et al., 2009). One of the most commonly used drugs during adolescence is marijuana (Lac & Crano, 2009). Since parental monitoring has been found to be the factor most predictive of drug use, it is important to examine whether monitoring has as strong of an impact on marijuana use as it does on overall drug use.

In 2009, Lac and Crano published a meta-analysis of the parental monitoring literature. Articles included in the meta-analysis were based on the following factors: a) participants were adolescents, b) the studies conceptualized and named the parenting variables as 'parental monitoring' which measured the level of awareness parents had about their adolescents' whereabouts, activities, and friends, c) marijuana was a distinct variable (i.e., not part of a compounded definition of substance use), and d) data was collected via adolescent self-reports. The findings were powerful; monitoring consistently predicted marijuana use. The results proved to be even more robust when the authors concluded that approximately 7358 articles showing non-significant results would need to be produced for the predictive value of monitoring on marijuana use to be challenged and undermined.

Although Lac and Crano's (2009) review highlights the significant role parental monitoring plays in predicting adolescent marijuana use, it also underlined the major controversy currently playing out in the monitoring field. Specifically, researchers have begun to debate the

conceptualization of the monitoring construct emphasizing the inconsistent ways it has been measured and defined (Kerr et al., 2010). Parental monitoring, defined as "a set of correlated parenting behaviours involving attention to and tracking of child's whereabouts, activities, and adaptation" (Dishion & McMahon, 1998, p. 65), often was not congruent with the items used to capture it. In particular, the items often did not reflect parents' active efforts – that is, parent initiated behaviours such as solicitation and control – and instead tapped into a different construct altogether – parental knowledge. Lac and Crano found that most of the monitoring studies they reviewed included items that asked adolescents to gauge how much their parents *knew* about their whereabouts, activities, and friends, and only infrequently were items included that asked adolescents *what* their parents did to gain this knowledge.

Parental Monitoring versus Parental Knowledge

Stattin and Kerr (2000) proposed that the claims researchers have been making regarding the impact of monitoring on adolescent drug use and more specifically, the recommendations that have been made encouraging parents to be better monitors of their children, may in fact be wrong. Stattin and Kerr pointed to the items used to measure monitoring as the culprit for the inaccurate conclusions; they argued that items are much more representative of parent's level of knowledge and inadvertently, adolescent's spontaneous disclosure of information. For instance, researchers often ask adolescents to respond to questions such as 'how much do you tell your parents where you're really going out on the weekends' (Barnes & Farrell, 1992) and 'how much do your parents know about your whereabouts and activities' (Dodge et al., 2009; Patterson & Stouthamer-Louber, 1984).

What is parental monitoring? To further investigate and distinguish what monitoring actually is, Stattin and Kerr (2000) identified two behaviours that were representative of the

'active' definition of monitoring – parental solicitation (e.g, "How often do your parents talk with your friends when they come over to your house? How often do your parents ask you about what happened during your free time?") and parental control (e.g., "Must you have your parents' permission before you go out on weeknights?" "If you have been out past curfew, do your parents require that you explain why and tell who you were with?"). In addition to these parent-initiated activities, Stattin and Kerr added an adolescent-initiated behaviour – adolescent spontaneous disclosure (e.g., "Do you spontaneously tell your parents about your friends (which friends you hang out with and how they think and feel about various things? How often do you usually want to tell your parents about school (how each subject is going; your relationships with your teachers?") – to investigate the relationship its relationship to *level of parental knowledge*.

Wanting to keep consistent with the monitoring literature, Stattin and Kerr used the term 'parental monitoring' and its traditionally associated items (e.g, "Do your parents: know what you do during your free time? Know who you have as friends during your free time?"). Through the examination of the unique contributions of solicitation, control, and disclosure on 'monitoring', and its effect on adolescent norm-breaking behaviour (e.g, alcohol use, marijuana use, vandalism, theft), Stattin and Kerr hoped to highlight whether monitoring was in fact a result of parents' active efforts or whether it was more representative of parental knowledge as gained through adolescent spontaneous disclosure. To strengthen the validity of the results, both parents and adolescents were asked to report on all measures (i.e, monitoring, solicitation, control, disclosure, and norm-breaking behaviour).

The results were consistent with the literature in that the traditional items measuring 'monitoring' were predictive of norm-breaking behaviour. The findings also showed that this traditional measure of 'monitoring' was not a result of parent-initiated activities – in fact,

disclosure was its strongest predictor. That is, adolescent disclosure was the best predictor of how much information parents knew regarding their adolescent's activities and friends (i.e., what had been called monitoring in the literature for years). These results bear significant implications for the monitoring literature because they suggest that the 'monitoring' construct conceptualized as a parent-initiated activity has been largely misrepresented in the deviant and substance use literature.

Stattin and Kerr's (2000) findings beg the following questions. Do the items representing 'monitoring' actually measure the end-product of an adolescent-initiated activity (i.e., disclosure) compared to a parent-initiated one (e.g., control)? If so, does it mean that the end-product of disclosure is much better represented as parental knowledge? Are parental knowledge and parental monitoring even related? Furthermore, if parental knowledge is actually what is being measured, what does it suggest about the robustness of the accepted conclusion that parental monitoring impact adolescent deviancy and substance use? In an effort to answer some of these questions, Kerr and Stattin (2000) produced more findings that further supported the need to re-conceptualize monitoring.

Active monitoring efforts and its impact on delinquency. Kerr and Stattin (2000) set out to determine whether isolating the active parenting practices associated with parents' efforts to monitor their children (i.e., solicitation and control) would show the same predictive effect that 'monitoring' as the traditional broad construct had on adolescent adjustment (e.g., delinquency). Consistent with their other study (Stattin & Kerr, 2000), monitoring was defined in line with the traditional monitoring literature. Parents and adolescents were again asked to answer all measures (disclosure, solicitation, control, adolescent delinquency).

The protective effect of parental monitoring was supported; that is, the traditional parental monitoring construct was found to be inversely related to delinquency. However, separating out various aspects of the construct into solicitation, control, and disclosure revealed some surprising patterns. Contrary to the notion of monitoring as a parent-initiated activity, parental control and solicitation had fewer significant associations to adolescent adjustment than did adolescent disclosure. In fact, controlling for parental solicitation or parental control independently did not significantly change the relationship between 'monitoring' and delinquency; on the other hand, controlling for disclosure significantly decreased the relationship between 'monitoring' and adolescent reported overall delinquency and associations with deviant friends. This suggests that the definition of monitoring as parents' active efforts is misleading since disclosure – an adolescent initiated activity – was the most potent contributor of the relationship between the traditional monitoring construct and adolescent delinquency.

Kerr and Stattin (2000) purport that the findings speaks to the major controversy of the monitoring literature; specifically, that the items used to measure parental monitoring better reflect parental knowledge obtained as a result of adolescents' willingness to disclose information. Kerr and Stattin suggest that the conclusion that parental monitoring is the most consistent predictor of adolescent delinquency is incorrect. Instead, the parenting factor that is most predictive of adolescents' behaviour and development is in fact, parental knowledge.

These findings have significant implications for the kinds of recommendations experts make to parents about how to prevent or reduce adolescent delinquent behaviour. Clearly, recommendations to parents which encourage them to increase their monitoring efforts are based on erroneous conclusions since the protective value of the monitoring activities likely has been overestimated. In fact, the findings showed that parental control was positively associated with

lower adjustment. What the findings do recommend is that monitoring as it currently stands may not adequately reflect its relationship to adolescent deviancy, and more specifically, marijuana use.

Gender differences. Findings showed that females reported more disclosure than males and from the adolescent's perspective, parents solicited more information from females than males (Stattin & Kerr, 2000). The link found between disclosure and 'monitoring' may be related to previous findings citing males to be less 'monitored' than females. The fact that males disclose less and therefore have parents who know less about their lives, may be the reason why males are consistently found to have higher adjustment problems than females (Kerr & Stattin, 2000)

Parental Monitoring is Parental Knowledge?

The aftermath of the Kerr and Stattin articles (Kerr & Stattin, 2000; Stattin & Kerr, 2000) have resulted in much confusion in the monitoring literature. The resulting studies witnessed researchers using 'parental knowledge' as its main variable although it was being informed by the monitoring literature; this resulted in readers assuming that parental knowledge was merely a substitute term for parental monitoring. Although it sounds reasonable, the mere substitution implies that monitoring and knowledge are interchangeable and thus, related to each other. Lac and Crano's (2009) review of the literature clearly documented this problem. They found that between 2000 and 2008, the parental monitoring variable was defined inconsistently, with some scales using items that tapped into parental knowledge as well as parent's active monitoring efforts. Lac and Crano also noted that some studies continued to use parental monitoring as a variable even though the items used to represent it were clearly assessing knowledge.

Parental Knowledge: Family Factor Most Critical in Predicting Delinquency

To promote the creation of parental knowledge as a new and distinct construct from parental monitoring, Kerr, Stattin, and Burk (2010) examined whether disclosure was more predictive of knowledge over time when compared to solicitation and control. Kerr et al. also investigated the trajectory of parental knowledge on adolescent norm-breaking behaviour (e.g., vandalism, stealing, etc.).

With these goals in mind, Kerr et al. (2010) asked adolescents and their parents to complete the following measures: parental control, parental knowledge (e.g., "does your parent know what you do during your free time? do your parents know where you go when you are out with your friends at night?"), parental solicitation, adolescent delinquency, and adolescent disclosure. The results showed that disclosure was the strongest predictor of knowledge and was the only factor to contribute to increased parental knowledge over time. In fact, adolescent disclosure increased parents' solicitation suggesting that parent's efforts to know more about their adolescent were influenced by adolescent's willingness to share information with them, not the other way around. Furthermore, an increase in control was found to be related to decreasing knowledge over time.

The findings also question the negative relationship often found between monitoring (i.e., solicitation, control) and adolescent delinquency. In particular, solicitation was found to have a positive relationship with delinquency. The results *do not* suggest that as parental monitoring levels decreased, adolescent delinquency increased; the results *do* suggest that as parental knowledge decreased, adolescent delinquency increased and as monitoring activities increased (e.g., solicitation), the likelihood of adolescents engaging in delinquent behaviour also increased. On the other hand, adolescent disclosure and delinquency were inversely related. Specifically, if

adolescents reported low levels of disclosure initially, they were more likely to report higher levels of delinquency over time.

Parental Knowledge: A Valuable Predictor of Adolescent Marijuana Use

Kerr et al.'s (2010) results suggested that much of the previous research focused on the impact of parental monitoring on drug use, including marijuana, (Bahr et al., 2005; Barnes et al., 2000; Chilcoat & Anthony, 1996; Claes, et al., 2005; Reitz et al., 2007; Svensson, 2003; Tobler & Komro, 2009) need to be reconceptualized. Moreover, the reconceptualization needs to take into account that parental knowledge is separate from monitoring. The important role of parental knowledge can be seen through Lac and Crano's (2009) meta-analytic review in which they found that studies using pure parental knowledge scales had a more robust effect on predicting adolescent marijuana use than measures which included a constellation of monitoring activities (Lac & Crano, 2009). Thus, examining the role of parental knowledge – as separate and distinct from parental monitoring – on marijuana use is warranted. Although parental knowledge had been found to be the most reliable predictor of marijuana use out of the constellation of factors in the monitoring literature, there have been relatively few studies investigating the role of parental knowledge in predicting adolescent drug use as informed by Kerr et al.'s (2010) re-conceptualization of the construct.

The Peer Context

The stage of adolescence is characterized by the developmental aims of individuation and autonomy as well as a shift in focus away from the importance of the family to that of peers (Brown, 2004; Grotevant & Cooper, 1986). The shift is believed to be accompanied by the family's decreasing influence on adolescent development as a result of the increasing influence of adolescent's peers. Parents begin to relinquish their hold on adolescent's decisions and

responsibilities and make room for adolescent's increased interactions outside the home (Hill, 1980). Some researchers would argue that the decreased time at home renders the peer context the most important to consider when examining factors which contribute to adolescent adjustment, deviancy and substance use.

The Importance of Peers During Adolescence

Harris (1995) proposes that the family context has no impact on adolescent outcomes because especially during adolescence, peers have the most influence on adolescent's life status adjustment. Harris notes that little evidence exists suggesting adolescents' behaviours in the home generalize to adolescents' behaviours outside of it. In fact, Harris argues that behaviour is context specific wherein people realize quickly, what the norms and standards of behaviour are within specific contexts and learn to differentiate between which behaviours are appropriate or not within each setting. As a result, adolescents quickly learn that behaviour expected by parents at home often does not coincide with the behaviour expected of them by their peers. Consequently, behaviour is tailored to fit the specific context in which it was learned and carried out. During adolescence, most behaviour occurs outside the home with peers. Harris claims that the behaviours adolescents learn and the relationships adolescents have within their peer group become the most significant models for adolescent's behaviours – both social and antisocial.

Harris' (2000) argument for the importance of peers centres around group socialization theory which posits that people base their behaviour on the behaviour of others who belong to a group that the individual identifies with. For adolescents, their age, height, style, biological and physical attributes denote them membership in group 'adolescents' not group 'adults'. Harris argues that adolescents begin to create a culture that dictates the factors that contribute to self-esteem, identity, and individuation. Since deviant behaviour often occurs within the peer

context, deviant behaviour, including substance use, is also assumed to be a socialized behaviour of deviant peers. However, it is important to note that Harris' views are controversial; researchers have questioned her claims, arguing against her beliefs which negate the environmental influence of the family context on adolescents' development (Vandell, 2000). Nonetheless, Harris' viewpoint is important to explore as peers have been found to be a powerful influence in the lives of adolescents (Aboud & Mendelson, 1996; Brendgen, Vitaro, & Bukowski, 1998).

The Peer Context and Adolescent Development

The influence of the peer context on adolescent development has been well documented. Researchers have found the peer context to be an important environment in which adolescents can practice and enhance the basic social skills they acquired in their home environment (Hartup, 1989). It is within the peer context that adolescents first learn about the complexities inherent in all relationships, introducing adolescents to the concept of intimacy as well as opportunities to achieve it with others (Berndt, 1982; Hartup, 1989). The peer group provides adolescents with the benefits of friendship such as social support, reciprocity, companionship (Epstein, 1983), and approval (Cohen, 1977); factors that have been found to contribute significantly to well-being and sense of self. Furthermore, peer relationships serve as primary sources of confidence, self-worth, and positive enjoyment for the adolescent (Aboud & Mendelson, 1996; Howes, 1983).

Individuation and identity development. Researchers have found that peer relationships assist the adolescent in developing a self-concept that is independent of and different from the expectations cultivated within the parent-adolescent relationship (Kandel, 1996; Maxwell 2002). Since the main task of the adolescent stage is individuation and identity development, the peer group provides the forum in which the adolescent can accomplish this task

without influence from members outside of the adolescent's peer group (i.e., adults). The peer group provide opportunities for the adolescent to form egalitarian relationships in which the adolescent is given the freedom to execute their own decisions and to explore their beliefs, values, and preferences in their efforts to accomplish individuation (Buhrmaster, 1990; Marcia, 2002).

Contributions to psychological health. The presence of significant peer relationships during adolescence has been found to impact adolescents' feelings of happiness, isolation, and depression. Specifically, adolescents who report not having any friends showed higher levels of loneliness and depression (Brendgen et al., 1998) when compared to adolescents who had at least one friend. Buhrmaster (1990) suggests that the presence of friends provides social input and interaction that contributes significantly to one's happiness and psychological health. In fact, being rejected by peers have been found to contribute considerably to adolescent's increased aggression (Sussman et al. 2007) and engagement in health-risk behaviours (La Greca, Prinstein, & Fetter, 2001). It seems that like parents, the peer context has as much influence in fostering negative adolescent outcomes as much as it has in fostering positive ones.

Developing meaningful relationships. The peer context has also been found to help adolescents understand how to form meaningful, relationships with their fellow age-mates (Berndt, 1996). The defining qualities of peer relationships are cooperation, mutual respect, reciprocity, loyalty, and disclosure (Berndt,1996; Hartup, 1989); these qualities help the adolescent learn how to develop intimacy and tenderness with and provide companionship, acceptance, and support to others (Buhrmaster,1990). The relationships developed within the peer context also provide the adolescent experience with managing conflicts which have interpersonal and social consequences (Buhrmaster, 1990). Ultimately, the peer context provides

adolescents an environment in which their interpersonal competence can be cultivated, enhancing their ability to successfully form and maintain relationships.

Peer Group Influence on Adolescent Delinquency and Substance Use

Investigations aimed at understanding the etiology of adolescent deviant behaviour often point to its significant association to peer group influences. Adolescents – a group whose members share specific traits, age, and developmental trajectory (MacCoby, 1990; Hamm, 2000; Kandel, 1996)– are further divided into categorical peer groups (e.g., burnouts, brains, populars, jocks) in which membership is based on adolescent's adherence to each group's norms, behaviours, dress, and preferences (Aboud & Mendelson, 1996; Hartup, 1989). The influence of the peer group resides in members' desire for homogeneity (Cohen, 1977) wherein members strive to decrease within group differences by becoming more similar and increase between-group differences by enhancing the characteristics that set the groups apart (Harris, 2000). Members who are dissimilar or who find that they are unable to compromise their attitudes and behaviours to align to group norms will eventually leave, making the peer group even more homogenous (Cohen, 1977).

Peer group homogeneity increases the risk for an adolescent to become deviant if the norms of the peer group are characterized by members' engagement in deviant behaviour (Simons & Robertson, 1989; Bahr et al., 1998; Brown, Lamborn, Mounts, & Steinberg, 1993). The culture cultivated within deviant peer groups lead members to model and engage in deviant behaviour (Akers, 1998), resulting in a group norm that is largely based on delinquent values (Agnew, 1993). This has been supported by findings reporting that adolescents who have non-deviant friends do not engage in deviant behaviour (Brown, Lohr, & McLenahan, 1986) while those who engage with deviant friends report higher levels of deviancy (Brengden et al., 2000).

The influence of peer group on deviant behaviour has been exemplified best in research that has studied its predictive power on adolescent's substance use. Specifically, research looking at the similarities between members of the same peer group has found adolescents to be most similar in their reports of substance use behaviours, even more so than ethnicity or academic orientation (Hamm, 2000).

Research consistently has shown that adolescent's own use is significantly associated to the substance use behaviours of their peer groups. Simons-Morten (2007) for instance, found a strong positive association between adolescent's increasing levels of substance use and adolescent's substance using peers. Furthermore, Sieving, Perry, and Williams (2000) also found that adolescent's friendship groups influenced the trajectory of adolescent's alcohol use; specifically, high levels of drug and alcohol use by peers was found to be significantly associated to levels of alcohol use over time. Additionally, being part of a group wherein the majority or network were characterized by peers who used cigarettes, alcohol, and drugs, showed a positive relationship to adolescent's regular use of substances (Griffin, Botivin, Scheier, & Nichols, 2002; Kobus & Henry, 2009). It seems that the attitude and endorsement of substances within one's peer group directly influences adolescent's own tendency to engage in substance use (Palmqvist & Santavirta, 2006).

Gender differences. Involvement and membership within peer groups have been found to differ between the genders. Muus (1996) reported that the influence of the peer group on adolescent deviancy was more pronounced in males; this is congruent with findings that have reported males to belong to peer groups that are typically bigger (Belle, 1989). Males are also more likely to spend a large amount of time engaging in peer group activities than females (Belle, 1989). Females on the other hand, are more likely to form supportive and warm

relationships that are dyadic in nature, and exchange more intense and intimate personal information than males (Berndt, 1982). As a result, males may experience more pressure to conform to peer norms and thus, have a higher predisposition to engage in delinquent behaviour

Peer Group Influence and Adolescent Drug Use

Peer group influences seem to vary depending on the type of drug being examined. For instance, adolescent's use of cigarettes has been found to occur more often in isolation than an activity linked to peer group influences (Ennett & Baumann, 1994). Since it cannot be assumed that an adolescent's peer group has the same influence on adolescent's drug, cigarette, and alcohol use, examining the impact of peer groups on a specific type of substance (e.g., drug use) would pinpoint the ways in which peers contribute to adolescent's uptake and maintenance of the substance in question. Studies investigating adolescent drug use often report the presence of drug users within the adolescent's peer group (Al-Kandari et al., 2001). Barnes, Barnes, and Patton (2005) for example, found that peer use had a significant positive association to the frequency of adolescent's drug use. Specifically, adolescents who reported high levels of drug use (e.g., marijuana, hash, cocaine, crack, LSD, speed or heroin) also reported that a high proportion of their friends used drugs.

In an effort to isolate how peer groups influence adolescent's behaviours, La Greca, Prinstein, and Fetter (2001) identified and examined the presence and influence of peer groups commonly found in the high school setting: jocks, brains, burnouts (i.e., skipping school, getting into trouble), populars, nonconformists (e.g., rebelling, against the norm in clothing or ideas, not conforming to social ideals, etc.), and none/average. Adolescents were asked to identify whether or not these crowds existed in their own high schools and to place themselves in the group wherein they felt they belonged. Adolescents were also asked to report their engagement in

health risk behaviours as well as the behaviours of five of their best friends; these behaviours included reporting substance use (e.g., marijuana use).

The results showed that the highest levels of marijuana use occurred primarily in the burnout crowd and secondly in the non-conformist crowds; the jocks and populars tended to show low levels of substance use. Most importantly, friends of burnouts and non-conformists were most likely to use marijuana when compared to the other groups. In contrast, no one in the brain crowd reported using marijuana use or having friends who used marijuana; that is, no one from the burnout and non-conformist crowd associated with the brain crowd and vice versa. What was most interesting from these findings is the result which showed that 82% of the adolescents stated having at least 1 out of their 3 best friends in their group. These findings propose that peer groups exert a powerful influence on adolescents' marijuana use in addition to highlighting that exclusive dyadic 'best friendships' are present within the peer group. As a result, examination of the literature regarding the impact of best friends on adolescent marijuana use is performed; it is believed that doing so would assist in discerning whether the influence of a best friend is more robust than the influence of the peer group.

Gender differences. Brown et al. (1993) reported that males tend to belong to peer groups that exhibit more deviant behaviours (e.g., burnouts) than females (e.g., brains); these findings have been supported by results reported by La Greca et al (2001). These results support other findings that have also found males to have higher levels of exposure to peer deviance than females (Svensson, 2003). Lastly, the effect of peer groups on adolescent drug use differ for males and females; although peer group deviance has significant effects on both genders, the effect seems to be more powerful on males than it is for females (Svensson, 2003).

Best Friend Drug Use and Own Marijuana Use

It is believed that the relationship fostered in the dyadic relationship is likely the most powerful influence in a person's life (Harris, 2000). During mid to late adolescence, the structure of the peer group begins to change and adolescents start to form dyadic relationships that are characterized by high degrees of cooperation and similarity (Brown et al., 1986; Dishion & Piehler, 2009). The potency of the peer group is no longer as influential due to the increasing influence of the adolescent's closest friends – that is, their best friends – who play an important role in the socialization of adolescents; in other words, a best friend becomes the primary source of the adolescent's social reinforcement (e.g., companionship, friendship, intimacy, support) (Kandel & Andrews, 1987). If the adolescent's best friend engages in deviant behaviour, it puts the adolescent at risk because adolescents and their best friends have been found to display similar levels of deviancy including substance use (Dishion, Capaldi, Spracklen, & Li, 1995). In fact, research has found that best friends' initiation of use significantly influenced the adolescent's decision to try drugs (Urberg, Degirmencioglu, & Pilgrim, 1977).

Studies looking at best friend's drug use and adolescent marijuana use have often found a significant positive relationship between the variables. For instance, Bahr et al., (1998) studied the influence of best friends substance use (i.e., alcohol, tobacco, marijuana, and other drugs) on adolescent's own drug use and found that adolescents who used marijuana were more likely to cite best friends as substance users. The impact of best friends was even more pronounced in a study conducted by Kandel and Andrews (1987) in which they pointed out that the role of best friends were to involve and model drug use behaviours to the adolescent; in 61% of the cases where a best friend was reported to use substances (i.e., hard liquor and marijuana), adolescents did in fact engage in marijuana use. Moreover, Kandel and Andrews found that adolescents

were more likely to model marijuana use than alcohol use even if their best friend engaged in both. This finding suggests that best friends may have a stronger influence in the involvement of marijuana use than alcohol use. Taken together, these results suggest the importance of articulating the role of best friends' drug use on adolescent's use of marijuana.

The Parent and Peer Context

The research presented support Bronfenbrenner's model – that both parents and peers likely play important roles in influencing adolescent drug use. Consistent with Bronfenbrenner's assertion, some researchers have argued for the inclusion of both parents *and* peers in examinations of factors that impact adolescents' drug use. Brown et al. (1993) for instance, found that parents' knowledge about their adolescents' whereabouts, activities, and friends – which they called parental monitoring – was significantly associated with peer group affiliation; peer group affiliation on the other hand, directly impacted adolescents' drug use behaviours. The presence of significant effects of peers and parents on adolescent drug use proposes the need to study whether or not peers and parents have direct and/or indirect effects.

Parents and Peers: Pathways to Adolescent Marijuana Use

Ary, Duncan, Duncan, and Hops (1999) studied the impact of parental practices and peer drug use on adolescent substance use (e.g., monthly marijuana rate) over time. Adolescent's perception of whether they received inadequate parental monitoring was measured. To investigate the impact of peer influence on adolescent substance use, Ary et al. looked at peer deviance related to drug use (e.g., friends would dare adolescent to use drugs, number of times adolescent's friends had problems with drugs, and how many of adolescent's five closest friends used marijuana). The results showed that parents and peers impacted adolescent substance use through multiple pathways. It was found that associations with deviant peers had a direct

significant effect on adolescent substance use as did parental monitoring. Overtime, peer deviance was shown to mediate the effect between inadequate levels of monitoring and later adolescent substance use.

Another study examining the pathways of parental monitoring and deviant peers was conducted by Bahr, Hoffman, and Yang (2005). This study asked adolescents to report their use of marijuana and other illicit drugs (e.g., amphetamines, sedatives) during the past 30 days. To examine peer effects, adolescents were also asked to identify four best friends and report their use of the same substances as well as to respond to questions regarding their siblings' use of alcohol, cigarettes and marijuana. To examine parental monitoring, adolescents were asked their perceptions on the following items: 'If you drank some beer or wine or liquor without your parents' permission, would you be caught by your parents? If you carried a handgun without your parents' permission, would you be caught by your parents? If you skipped school, would you be caught by your parents?'. The findings confirmed the importance of parents and peer effects on adolescent drug use. Specifically, results showed that parental monitoring was most significant for predicting levels of marijuana use and that this relationship was partially mediated by peer effects; although significant, this mediating effect was small. It should be noted however, that the strongest mediating peer effect was sibling drug use and not best friend drug use.

Although these findings provide further support for the need to understand how peers and parents influence adolescent drug use, three major concerns must be considered in future studies in light of the research reviewed. First, in most of the research presented, the items used to measure parental monitoring actually reflect parental knowledge (Kerr et al., 2010). Similar to Brown, et al. (1993), the monitoring measure used by Ary et al. (1999) did not adequately

represent monitoring activities; these items were much more indicative of adolescent disclosure and level of parental knowledge (e.g., 'before going out, child tells parents when they will be back', 'parents let child go places without asking', and 'child does things without telling parents'). Bahr et al. (2005) also did not adequately represent monitoring. Their items represented more of the adolescent's perception regarding how much their parents know about where they are, who they are with, what they are doing, and the likelihood of being caught when engaging in a range of delinquent activities, rather than parental monitoring. The discrepancies found regarding the measurement of monitoring within the parenting literature limit confidence in the findings and the conclusions about the role of parental monitoring and its impact on peers and adolescent drug use.

Secondly, researchers have found that the influence of peer groups may not be as salient as the influence of a best friend, especially since adolescents begin to move out of their peer group and into dyadic relationships during mid to late adolescence (Harris, 2000). Perhaps, the findings from Brown et al. (1993) which suggested that parents may have indirect effects on adolescent drug use through peers would have been strengthened if the impact of best friend rather than peers was used. Furthermore, Bahr et al.'s (2005) finding that revealed friends' drug use to be less powerful than the effect of sibling drug use with regards to its mediating effect on parental monitoring and marijuana use may have resulted from their measure of four best friends' drug use rather than one best friend. It is possible that analyzing the effect of one best friend would highlight the significant influence this dyadic relationship can have on adolescents' engagement in marijuana use.

Finally, the notion that different substances may manifest different trajectories in terms of its uptake, maintenance, and etiology should be addressed. For example, Ary et al. (1999) used

drug use as one item that made up the composite measure of adolescent substance use (e.g., alcohol, drugs, cigarettes). Brown et al. (1993) on the other hand, used a composite measure of drug use that included different types of drugs such as marijuana, hallucinogens, and cocaine. Perhaps studies that focus on adolescent's use of one substance such as marijuana may prove to more robust; conclusions would rely less on inferences made from studying the effects of parent and best friend effects on adolescent marijuana use that is based on composite measures of substance or of drug use.

Clarifying Pathways to Adolescent Marijuana Use

The present study hopes to address these three major concerns in articulating the direct and indirect influence of parents and peers on adolescent marijuana use. This study focuses solely on marijuana use as it has been found to be the drug of choice amongst adolescents (Dodge et al., 2009). Furthermore, marijuana use has also been linked to physical, social, and mental health problems (AADAC, 2004; Bogenschneider et al., 1998). Specifically, the present study will look at investigating the role of perceived parental knowledge (conceptualized as distinct from monitoring) (Kerr et al., 2010), on adolescent marijuana use. Specifically, the present study will examine whether perceived parental knowledge deters adolescents from using marijuana. Furthermore, the present study will look at the influence of best friends by analyzing whether or not best friends' drug use has a significant effect on adolescent marijuana use. In particular, the present study will explore whether best friend drug use increases the likelihood an adolescent will engage in marijuana use. Finally, a mediation model will be tested to examine the different pathways parental knowledge and best friend's drug use has on adolescent marijuana use.

The present study will test mediation because research suggests that best friend drug use will mediate the relationship between perceived parental knowledge and adolescent marijuana use for the following reasons. First, based on the literature reviewed, it seems that parents influence who adolescents choose as friends, and more specifically, that when adolescents perceive their parents to have low levels of knowledge, they are more likely to associate with deviant peers than when they perceive higher levels of parental knowledge (Reitz et al., 2007). It is possible that when parents are involved in their adolescents' lives in supportive and non-controlling ways that adolescents are more willing to share information with them about their whereabouts, friends, and activities thus contributing to perceptions of higher levels of parental knowledge (Soenens, Vansteenkiste, Luyckx, & Goosens, 2006). Perceived parental knowledge may deter adolescents from engaging with deviant peers because adolescents feel the presence, guidance, and expectations of parents in their lives (Fletcher, Steinberg, Williams-Wheeler, 2004) and are more likely influenced by the trust they believe their parents have in them (Kerr, Stattin, & Trost, 1999), when making decisions on their own. These adolescent may follow their parents' expectations much more readily than adolescents who do not believe their parents know much about what they do or who they hang out with.

Secondly, best friend drug use is expected to mediate the relationship between perceived parental knowledge and adolescent marijuana use because research has found that parents can influence adolescents' association with a drug using peer and thus indirectly influence adolescents' substance use. It is believed that this relationship occurs through engagement with a drug using peer because the presence of a drug using peer directly influences adolescents' engagement in delinquent behaviour, including substance use (Brown et al., 1993; Nash, McQueen, & Bray, 2005). The research suggests that adolescents who associate with delinquent

peers (Fite, Colder, & O'Connor, 2006) and who have friends who use drugs (Thorne & DeBlassie, 1985) are at an increased risk to initiate drug use. Furthermore, Beman (1995) suggested that adolescent substance use is almost always, connected to peers; it is not surprising then that adolescents often cite the presence of a drug using best friend when they report marijuana use (Kandel & Andrews, 1987).

Taken together, the results suggests that a mediation model is an appropriate model to test as it seems that best friend drug use may mediate the relationship between perceived parental knowledge and marijuana use. Thus, it was expected that perceived parental knowledge would have an indirect effect on adolescent marijuana use through its influence on adolescents' association with a drug using best friend. Furthermore, the mediation analyses will be conducted separately for males and females since gender differences have been found for levels of perceived parental knowledge, best friend drug use and marijuana use. In particular, it is believed that the mediation model will show different relationships for males and females. Accordingly, the present study tested the following hypotheses:

a) males will report more marijuana use than will females,

b) males will report a significantly higher incidence of best friend drug use than will females and,

c) males will report significantly lower levels of perceived parental knowledge than females.

In terms of the mediation model, the present study will also test for the following hypotheses:

a) perceived parental knowledge will have a significant negative relationship with adolescent marijuana use,

b) perceived parental knowledge will have a significant negative relationship with best friend drug use,

c) best friend drug use will have a significant relationship with adolescent marijuana use,

d) best friend drug use will mediate the relationship between perceived parental knowledge and adolescent marijuana use, and

f) these relationship effects will differ significantly for males and females wherein,

f^{i}) best friend drug use will partially mediate the relationship between perceived parental knowledge and marijuana use for females, and

f^{2}) best friend drug use will fully mediate the relationship between perceived parental knowledge and marijuana use for males.

Methodology

Overview

To test the hypotheses, a secondary analysis of The Alberta Youth Experience Survey (TAYES) for 2005 was conducted. TAYES 2005 is part of a triennial survey conducted by the Alberta Alcohol and Drug Abuse Commission (AADAC) and the University of Alberta's Addiction and Mental Health Research Laboratory. TAYES 2005 examined if and how parents and peers contribute to adolescent problem behaviour (e.g., substance use and gambling). Overall, 3915 junior high and high school students participated in TAYES 2005. See Appendix A for more information on TAYES 2005.

Sample

The current study focused on high school students only. The high school sample in the TAYES 2005 consisted of 2552 (47% were males; 53% were females) students from Alberta high schools (34.1% in Grade. 10; 31.1% in Grade. 11; 34.8% in Grade 12). Students from the Edmonton region were over-represented (48.8%) followed by the Central (33.1%), North (13.3%), and South (4.8%) regions respectively. The overwhelming majority of the students were 15 years of age (28.8%), 16 years of age (31%) or 17 years of age (30.2%). A small percentage of students were 10 years of age or younger (0.5%), 13 years of age (0.1%), 14 years of age (2.1%), 18 years of age (6%), 19 years of age (0.9%), or 20 years of age or older (0.6%). The adolescents reported the following ethnic backgrounds: European (38.4%), Southeast/East Asian (9.2%), Eastern European (5.1%), South Asian (2.8%), African (1.8%), Scandinavian (1.7%), Aboriginal (2.8%), Latin/South American (0.8%), or Australian (0.6%) or other (22.1%). And, 14.7% of adolescents reported that they did not know their ethnic background.

In terms of household composition, 64.7% of the students lived with both their biological parents, followed by 14.3% who lived with their biological mother only, 10.1% who lived with one biological parent and one step-parent, and 3.2% who lived with their biological father only. The living arrangements of the remainder of the sample (7.8%) involved a variety of arrangements such as: shared custody, living with other relatives, adoptive parents, foster parents, with a friend or on their own. Half of the sample (48.7%) reported living in the same home over last five years. Almost a quarter (24.4%) of students had moved once, 20.8% had moved 2 or 3 times, 4.8% had moved 4 or 5 times, and 1.3% had moved 6 to 9 times. Less than 1% of students moved to a different home 10 or more times in the last five years.

In terms of the sample's academic profile, 8.1% did not like school at all, 14.1% did not like school very much, over half (52.3%) liked school to some degree, 16.6% liked school quite a lot, and 8.7% liked school very much. Thirty-seven percent expected a grade of A, most students expected to have a grade of B (42.3%), 15.2% expected a grade of C, 4.4% expected a grade of D, and 1.2% expected a grade less than D. An overwhelming majority of students expected to very likely stay in school until they graduate (89.3%), 9.6% expected to fairly likely graduate, 1% expected not very likely to graduate, and 0.2% expected not at all likely to graduate. The majority (50.9%) of students strongly agreed that they felt safe in their school, 43.1% agreed, 5.1% disagreed, and 0.9% strongly disagreed.

Measures

Perceived Parental Knowledge. Three questions on the TAYES 2005 were identified to reflect parental knowledge. Adolescents were asked about the extent to which their parents knew where they were after school, who they are with when they go out at night, and where they are when they go out at night. Respondents answered along a 5 point scale as follows: never (1),

rarely (2), sometimes (3), most of the time (4), and always (5). A parental knowledge scale was created from the mean of the three items. Cronbach's alpha for the three items was .85.

Best Friend Drug Use. To measure best friend use, two items on TAYES 2005 were used to assess best friend drug use. Respondents were asked to respond 'yes' or 'no' to each question: Does best friend #1 use illegal drugs? Does best friend #2 use illegal drugs? For the present study, a dichotomous variable was created to indicate whether at least one best friend or neither best friend used drugs.

Marijuana use. To assess adolescent marijuana use, a single question from the TAYES 2005 was used. This item asked adolescents how often they used cannabis (also known as marijuana, weed, grass, pot, hashish, hash, hash oil, etc.) over the past 12 months. Response choices included: 1 to 2 times, 3 to 5 times, 6 to 9 times, 10 to 19 times, 20 to 39 times, 40 or more times, used but not in the last 12 months, never used in lifetime, don't know what this is. The present study created a dichotomized variable to reflect whether participants had used or not used marijuana in the past year.

Results

The present study investigated the direct and indirect pathways of perceived parental knowledge and best friend drug use on adolescent marijuana use. First, descriptive analyses were conducted to measure the prevalence of adolescent marijuana use, perceived best friend drug use, and perceived level of parental knowledge. Next, correlational analyses were calculated to examine associations between perceived parental knowledge, best friend drug use, and marijuana use. These preliminary analyses were calculated separately for males and females. Two way ANOVAs were then conducted to explore gender and grade effects on each item of the perceived parental knowledge items and the perceived parental knowledge scale. Chi-square tests were conducted to explore differences between grade and gender for best friend drug use and marijuana use. Finally, logistic regression analyses tested the mediation model which explored the direct and indirect effects of perceived parental knowledge and best friend drug use on adolescent marijuana use. The mediation model was also tested separately for males and females.

Descriptive Analyses

In terms of perceived parental knowledge, analyses revealed that adolescents perceived that their parents knew about their whereabouts, activities, and friends most of the time (M = 4.1, SD = .86). However, males reported lower levels of parental knowledge (M = 3.9, SD = .92) than did females (M = 4.2, SD = .73) ($t(2528) = -9.67$, $p < .001$). In terms of best friend drug use, the analyses revealed that 33.4% of adolescents had a best friend who uses drugs. It was found that more males (38%) reported having a best friend who uses drugs when compared to females (29%) ($t(2459) = 4.74$, $p < .001$). The analyses also showed that almost half of the sample (42.2%) had used marijuana in the past year. Again, the results revealed that a higher

proportion of males (46%) engaged in past year marijuana use as compared to females (40%) ($t(2502) = 2.96$, $p < .01$).

Correlational Analyses

To explore whether or not perceived parental knowledge, best friend drug use, and marijuana use were related to each other, correlations were conducted. Although best friend drug use and marijuana use are at the ordinal level of measurement, as suggested by DeCoster (2004), Pearson moment-to-moment correlation coefficients are reported to capture the associations among perceived parental knowledge, best friend drug use, and marijuana use. There were significant negative correlations between perceived parental knowledge and marijuana use ($r = -.38$, $p < .01$) and best friend drug use ($r = -.23$, $p < .01$). For the correlations between best friend drug use and marijuana use, contingency coefficients are reported to account for the dichotomized nature of both variables. Not surprisingly, there was a significant positive correlation between marijuana use and best friend drug use ($C = .40$, $p < .01$). To explore gender differences, separate analyses were conducted for males and females – see Table 1. There was a significant negative correlation between perceived parental knowledge and marijuana use for males as well as for females. There was also a significant negative correlation between perceived parental knowledge and best friend drug use for males and females. Lastly, there was a significant positive correlation between best friend drug use and marijuana use for males and for females.

Table 1

Summary of Intercorrelations for Perceived Parental Knowledge, Best Friend Drug Use, and Marijuana Use as a Function of Gender

Measure	*1*	*2*	*3*
1. Perceived Parental Knowledge	-	-.18**	-.35**
2. Best Friend Use	-.26**	-	.43***[a]
3. Marijuana Use	-.41**	.37***[a]	-

Note. Scores above and below the main diagonal refer to males and females respectively.

***p*< .01, ****p*<.001, a = contingency

Testing Grade and Gender Effects

The next phase of analyses explored gender differences in parental knowledge, best friend drug use, and marijuana use. To examine whether males and females differed in their perception of parental knowledge and whether these differences became more pronounced as adolescents' grade level increased, a 3 (grade) X 2 (gender) ANOVA was performed for each of the perceived parental knowledge items and the parental knowledge scale. Tables 2 to 5 present the results of the ANOVAs. To explore the gender differences for best friend drug use and marijuana use, tests of chi-square were conducted for each variable. Tables 6 and 7 present the results of the chi-square tests.

Table 2 presents the means and standard deviations for adolescents' ratings regarding their perception of the extent to which their parents knew where they are after school. Analyses revealed a main effect for gender ($F(1, 2595) = 66.46$, $p < .001$) and a main effect for grade ($F(2, 2595) = 7.39$, $p < .01$). Overall, males perceived their parents to have lower levels of knowledge regarding their whereabouts after school ($M = 3.99$, $SD = .957$) than females ($M = 4.29$, $SD =$

.829). In addition, ratings of perceived parental knowledge of adolescents' whereabouts after school showed a slight increase from grade 10 (M = 4.17, SD = .909) to grade 11 (M = 4.24, SD = .830) and then showed a notable decrease in grade 12 (M = 4.05, SD = .902). This main effect was qualified by a grade by gender interaction ($F(2, 2595) = 9.55$, $p < .001$). This interaction is presented in Figure 1. Whereas there was no change in reported levels of perceived parental knowledge regarding adolescents' whereabouts after school across grade for females, for males there was no change in reported levels of perceived parental knowledge about their whereabouts after school from grade 10 to 11, but there was a notable drop in parental knowledge in grade 12.

Table 2

Means and Standard Deviations for Adolescents' Ratings of Perceived Parental Knowledge of extent to which their Parents Know Where they are After School by Grade and Gender

	Males		Females		Males & Females	
Grade	*N*	*M(SD)*	*n*	*M(SD)*	*n*	*M(SD)*
10	385	4.08(.997)	550	4.24(.836)	935	4.17(.909)
11	366	4.13(.879)	456	4.33(.779)	822	4.24(.830)
12	451	3.81(.958)	393	4.31(.873)	844	4.05(.952)
All Grades	1202	3.99(.957)	1399	4.29(.829)	2601	4.15(.902)

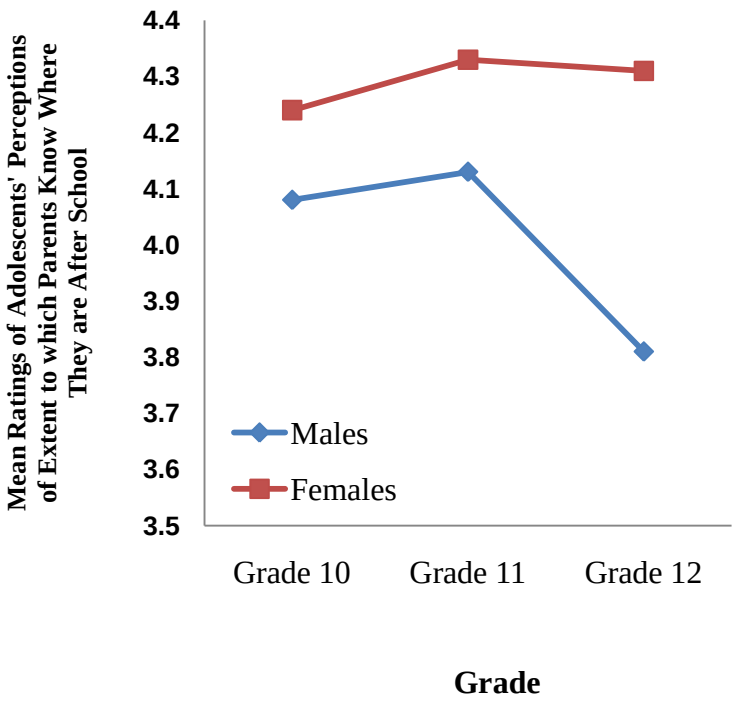

Figure 1. Mean ratings of adolescents' perceptions of extent to which parents know where they are after school by grade and gender.

Table 3 presents the means and standard deviations adolescents' ratings regarding their perception of the extent to which their parents know who they are with when they go out at night. Analyses revealed a main effect for gender ($F(1, 2594) = 64.83$, $p < .001$) and a main effect for grade ($F(2, 2594) = 16.20$, $p < .001$). Overall, males perceived their parents to have lower levels of knowledge regarding who they are with when they go out at night ($M = 3.91$, $SD = 1.08$) than did females ($M = 4.24$, $SD = .927$). In addition, overall ratings of perceived parental knowledge regarding who adolescents are with when they go out at night decreased with each grade. This main effect was qualified by a grade by gender interaction ($F(2, 2594) = 14.791$, $p < .001$). This interaction is presented in Figure 2. There was no change in reports of level of perceived parental knowledge regarding who adolescents are with when they go out night for females across grade whereas, males reported decreased levels of perceived parental knowledge regarding who they are with when they go out at night with each grade.

Table 3

Means and Standard Deviations for Adolescents' Ratings of Perceived Parental Knowledge of extent to which their Parents Know Who they are with When they go out at Night by Grade and Gender

	Males		Females		Males & Females	
Grade	*N*	*M(SD)*	*N*	*M(SD)*	*n*	*M(SD)*
10	385	4.14(.940)	549	4.21(.987)	934	4.18(.968)
11	367	4.01(1.05)	456	4.39(.862)	823	4.17(.962)
12	451	3.63(1.15)	392	4.22(.912)	843	3.91(1.09)
All Grades	1203	3.91(1.08)	1397	4.24(.927)	2600	4.09(1.01)

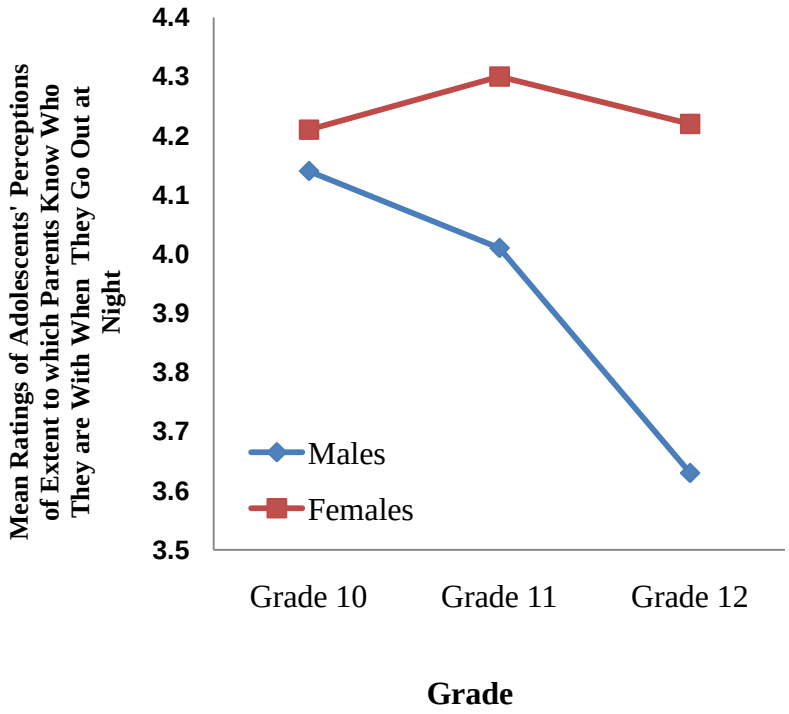

Figure 2. Mean ratings of adolescents' perceptions of extent to which parents know who they are with when they go out at night by grade and gender.

Table 4 presents the means and standard deviations adolescents' ratings regarding their perception of the extent to which their parents know where they were when they go out at night. Analyses revealed a main effect for gender ($F(1, 2593) = 63.47$, $p < .001$) and a main effect for grade ($F(2, 2593) = 16.59$, $p < .001$). Overall, males perceived their parents to have lower levels of knowledge regarding their whereabouts when they go out at night ($M = 3.82$, $SD = 1.07$) than did females ($M = 4.15$, $SD = .942$). In addition, overall ratings of perceived parents' knowledge regarding adolescents' whereabouts when they go out at night decreased with each grade. This main effect was qualified by a grade by gender interaction ($F(2, 2593) = 6.98$, $p < .001$). This interaction is presented in Figure 3. There was no change in reported levels perceived parental knowledge regarding adolescents' whereabouts when they go out at night for females across

grade whereas with each additional grade, males reported lower levels of perceived parental knowledge regarding their whereabouts when they go out at night.

Table 4

Means and Standard Deviations for Adolescents' Ratings of Perceived Parental Knowledge of extent to which their Parents Know Where they are When they go out at Night by Grade and Gender

	Males		Females		Males & Females	
Grade	*n*	*M(SD)*	*n*	*M(SD)*	*n*	*M(SD)*
10	386	4.03(.949)	549	4.19(.939)	935	4.12(.946)
11	366	3.89(1.07)	455	4.16(.912)	821	4.04(.995)
12	451	3.58(1.12)	392	4.09(.982)	843	3.82(1.09)
All Grades	1203	3.82(1.07)	1396	4.15(.942)	2599	4.00(1.02)

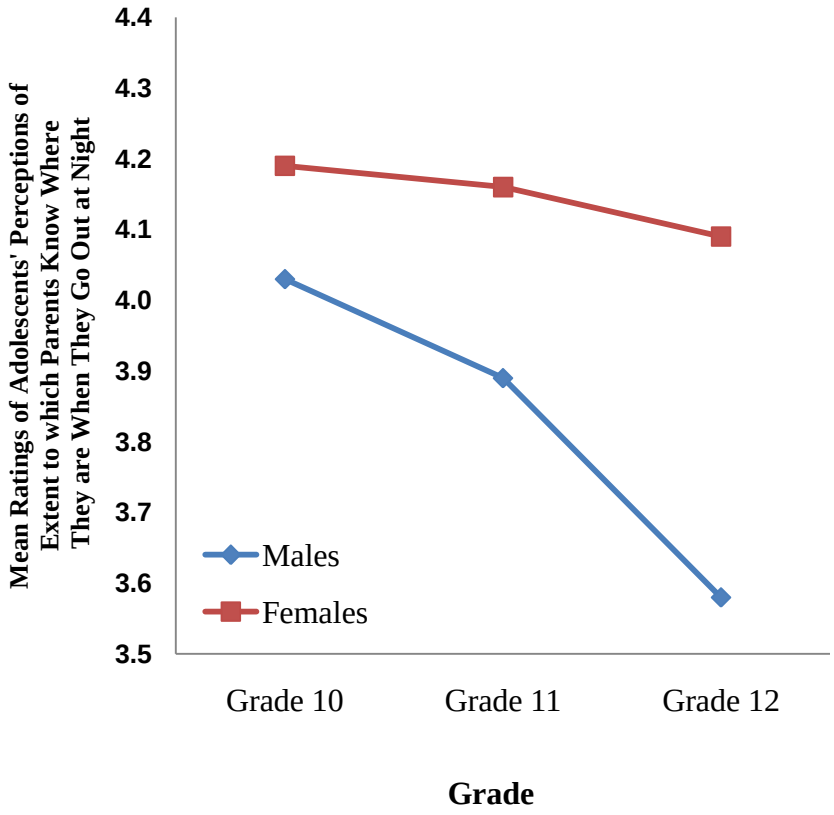

Figure 3. Mean ratings of adolescents' perceptions of extent to which their parents know where they are when they go out at night by grade and gender.

Table 5 presents the means and standard deviations for adolescents' ratings of perceived parental knowledge overall. Analyses revealed a main effect for gender ($F(1, 2597) = 85.03$, $p < .001$) and a main effect for grade ($F(2, 2597) = 15.94$, $p < .001$). Overall, males perceived their parents to have lower levels of parental knowledge ($M = 3.91$, $SD = .928$) than did females ($M = 4.23$, $SD = .766$). In addition, overall ratings of perceived parental knowledge decreased with each grade. This main effect was qualified by a grade by gender interaction ($F(2, 2597) = 13.01$, $p < .001$). This interaction is presented in Figure 4.There was no change in reported levels of perceived parental knowledge across grade for females whereas with each additional grade, males reported lower levels of perceived parental knowledge.

Table 5

Means and Standard Deviations for Perceived Parental Knowledge by Grade and Gender

	Males		Females		Males & Females	
Grade	*n*	*M(SD)*	*N*	*M(SD)*	*n*	*M(SD)*
10	386	4.08(.876)	550	4.21(.771)	936	4.16(.818)
11	367	4.01(.869)	456	4.26(.736)	823	4.15(.807)
12	451	3.68(.971)	393	4.21(.792)	844	3.92(.930)
All Grades	1204	3.91(.928)	1399	4.23(.766)	2603	4.08(.859)

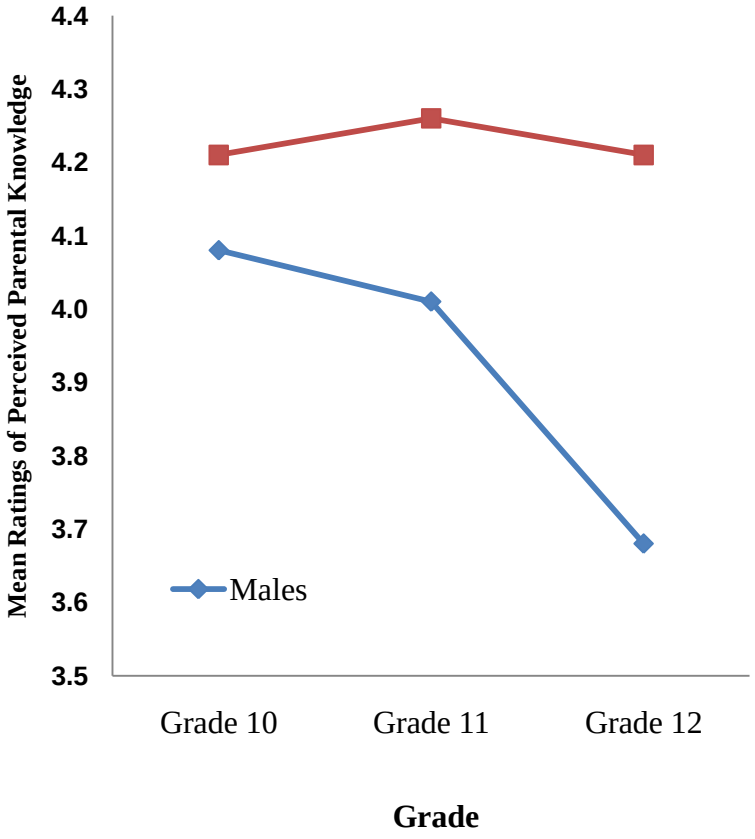

Figure 4. Mean ratings of adolescents' perceived parental knowledge by grade and gender.

Table 6 presents the proportions of males and females who report best friend drug use. Overall, a higher proportion of males reported best friend drug use than females. In addition, the proportion of adolescents who reported best friend drug use increased with each grade. The analyses found that during grade 10, the proportion of males (29%) and females who reported having a best friend who uses drugs were similar; in grade 11 however, a small difference for best friend drug use was found wherein more males (38 %) reported the incidence of best friend drug use than females (32%). A larger difference was seen for grade 12; there was a considerable increase of the proportion of males reporting best friend drug use (46%) compared to females whose reports of best friend drug use dropped below grade 10 levels. The findings showed that best friend drug use differed by grade for males ($\chi^2(1, N = 1151) = 25.53, p < .001$). This effect was not found for females ($\chi^2(1, N = 1151) = 25.53, p = .36$). These findings are presented in Figure 5.

Table 6

Proportion of Adolescents Reporting Best Friend Drug Use by Grade and Gender

	Males		Females		Males & Females	
Grade	*N*	*%*	*n*	*%*	*n*	*%*
10	346	28.6	503	29.2	849	29.0
11	340	37.6	426	31.9	766	34.5
12	465	46.0	405	27.4	870	37.3
All Grades	1151	38.3	1334	29.5	2485	33.6

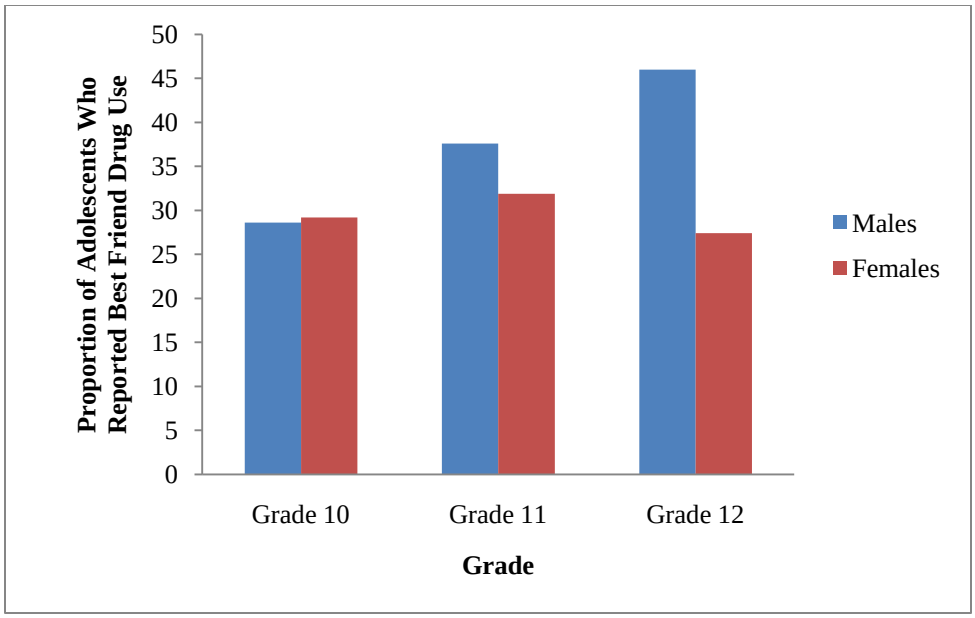

Figure 5. Proportion of adolescents who reported best friend drug use by grade and gender.

Table 7 presents the proportions of males and females who report marijuana use. Overall, a higher proportion of males reported marijuana use than females. In addition, overall, the proportion of adolescents who reported marijuana use increased with each grade. In terms of females' reports, there was a slight increase of the proportion of females reporting marijuana use from grade 10 to grade 11; no change was found from grade 11 to grade 12. On the other hand, the proportion of males reporting marijuana use increased substantially with each grade. Moreover, similar proportions of males and females reported marijuana use in grade 10 and 11. However, there was a large increase in the proportion of males who reported marijuana use (57.8%) in grade 12 compared to females (42.8%). The findings showed that marijuana use differed by grade for males ($\chi^2(2, N = 1171) = 56.65, p < .000$). This was also found for females ($\chi^2(2, N = 1333) = 6.40, p < .05$) although the effect only narrowly met conventional levels of statistical significance. These findings are presented in Figure 6.

Table 7

Proportion of Adolescents who Reported Marijuana Use by Grade and Gender

	Males		Females		Males & Females	
Grade	*n*	*%*	*n*	*%*	*n*	*%*
10	351	31.6	506	35.4	933	33.8
11	351	43.0	430	41.9	812	42.4
12	469	57.8	397	42.8	830	51.0
All Grades	1198	45.5	1333	39.7	2575	42.4

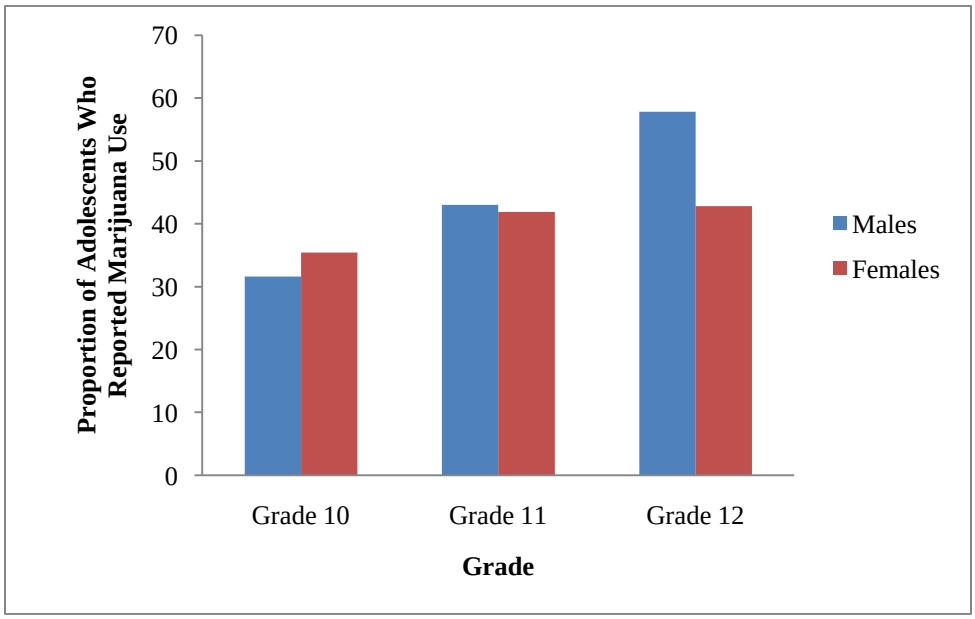

Figure 6. Proportion of adolescents who reported marijuana use by grade and gender.

Testing the Mediation Model

In order to examine the direct and indirect effects of perceived parental knowledge and best friend drug use on adolescent marijuana use, a test of mediation was conducted using the steps put forth by Baron and Kenny (1986). In such a model (Figure 7), it is hypothesized that

there are 2 pathways that influence an outcome (Baron& Kenny); as such, it is presumed that a relationship between perceived parental knowledge and adolescent marijuana use exists but that this relationship is mediated by best friend drug use. In order for a mediating variable to exist, the following conditions must be met:

a) variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., path a),
b) variations in the mediator significantly account for variations in the dependent variable (i.e., path b), and
c) when paths a and b are controlled, a previously significant relation between the independent and dependent variables is no longer significant, with the strongest demonstration of mediation occurring when path c′ is zero. (Baron & Kenny, p.1176).

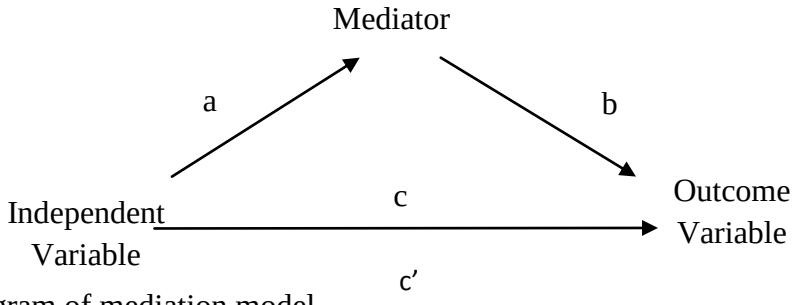

Figure 7. Path diagram of mediation model

Figure 8 (males) and Figure 9 (females) represent the results of the analyses as outlined by Baron and Kenny (1986). However, some adjustments were made to account for dichotomized mediator and outcome variables according to the recommendations of MacKinnon and Dwyer (1993). A preliminary logistic regression examined whether parental knowledge had a significant effect on adolescent marijuana use (path c). The analyses confirmed the hypothesis that perceived parental knowledge had a significant direct effect on adolescent marijuana use for

males (B = -.89, p <.001) and females (B = -1.31, p <.001) suggesting that as perceived parental knowledge increased, marijuana use decreased.

As suggested, three separate logistic regression analyses were performed to test for mediating effects. To establish whether the model meets the first required condition (i.e., perceived parental knowledge must affect best friend drug use), best friend drug use was regressed on perceived parental knowledge (path a). The results confirmed the hypothesis that perceived parental knowledge has a significant direct effect on best friend drug use for both males (B = -.40, p <.001) and females (B = -.73, p <.001); that is, as perceived parental knowledge increases, adolescents' report of best friend drug use decreases, meeting the first criteria of the mediation model.

The next step in testing for mediation requires an analysis of whether the influence of best friend drug use on marijuana use is significant; this requires regressing marijuana use on best friend use (path b). The analysis confirmed the hypothesis that best friend drug use has a significant direct effect on marijuana use for both males (B = 2.10, p <.001) and females (B = 1.54, p <.001); that is, as best friend drug use increases, adolescents reports of marijuana use also increases, meeting the second criteria of the mediation model.

The third and last condition required for mediation determines whether including best friend use in the regression equation decreases the effect of perceived parental knowledge on marijuana use. As such, a logistic regression was conducted in which marijuana use was regressed on perceived parental knowledge (path c′), including best friend drug use in the analysis. A mediating effect is said to occur if the effect of perceived parental knowledge is significantly reduced when the effects of best friend drug use is accounted for; a perfect mediation is demonstrated if the effect of perceived parental knowledge becomes null. The

analysis confirmed the hypothesis that the direct effect of perceived parental knowledge on adolescent marijuana use was significantly decreased when the relationships between perceived parental knowledge and best friend drug use, and best friend drug use and marijuana use, are taken into account. For males (Figure 8), the effect of perceived parental knowledge on adolescent marijuana use was significantly reduced from B = -.89, $p < .001$ to B = -.82, $p < .001$ (Sobel = -5.48) when best friend drug use was included in the regression. For females (Figure 9), the effect of perceived parental knowledge on adolescent marijuana use was also significantly reduced from B = -1.31, $p < .001$ to B = -1.15, $p < .001$ (Sobel = -7.02) when best friend drug use was included in the logistic regression.

The analyses revealed that for males and females, best friend drug use did not exhibit full mediation on the relationship between perceived parental knowledge and adolescent substance use. Therefore, the hypothesis that perceived parental knowledge would still exhibit a significant effect on adolescent marijuana use even when the effects of best friend drug use are considered was confirmed. Specifically, more perceived parental knowledge continued to predict less adolescent marijuana use.

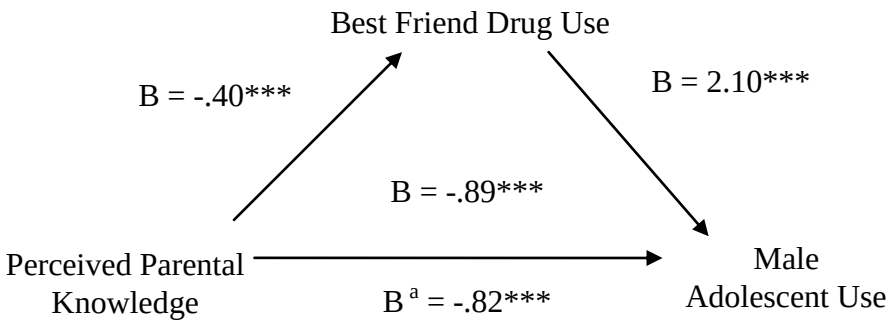

Figure 8. Relationship between perceived parental knowledge and male adolescent marijuana use as partially mediated by perceived best friend drug use. Note. Betas are unstandardized; [a]Beta coefficient after testing best friend variable as a mediator of the relationship between perceived parental knowledge and marijuana use.

*** $p < .001$

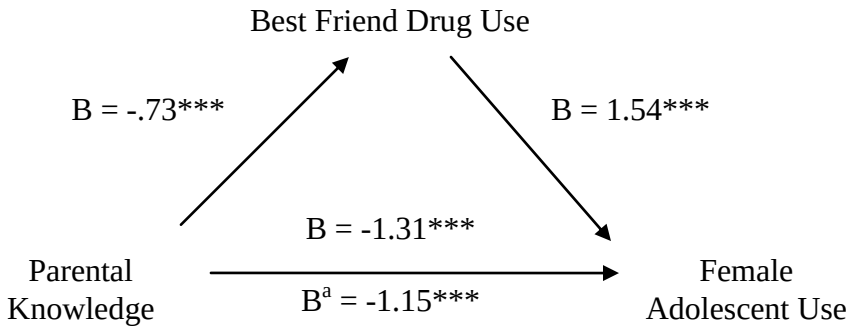

Figure 9. Relationship between perceived parental knowledge and female adolescent marijuana use as partially mediated by perceived best friend drug use. *Note*. Betas are unstandardized; [a]Beta coefficient after testing best friend variable as a mediator of the relationship between parental knowledge and marijuana use.

*** $p < .001$

Discussion

This study found that over 40% of high school students across Alberta reported using marijuana within the previous year, replicating the findings of previous research that prevalence of marijuana use is high among current youth (Dodge et al., 2009). Given what is known about the health effects of marijuana use (AADAC, 2004; Bogenschneider et al., 1998) and that marijuana can be a gateway drug to harder drug use (Griffin et al., 2002), understanding the factors that influence adolescents' use of marijuana is pivotal. In addition, as marijuana use increases, the risk of addiction increases, resulting in societal costs related for treatment (AADAC, 2004; Bogenschneider et al., 1998). The stage of adolescence is particularly important as adolescents are at an increased risk for initiating use (McCord, 1990). Moreover, adolescence also marks the time when peers become more influential in adolescents' lives; and adolescents turn less and less to their parents for direction and advice (Bogenschneider et al., 1998). Thus, adolescence is when youth can become influenced by deviant peers, increasing their risk of engaging in delinquent behaviour such as marijuana use.

In addition, the present study found significant gender differences with regards to adolescents' reports of perceived parental knowledge, best friend drug use, and marijuana use. For perceived parental knowledge, males reported lower levels of perceived parental knowledge overall. These findings are congruent with studies that have revealed females to perceive their parents as having higher levels of knowledge than their male counterparts (Barnes et al., 2000; Reitz et al, 2007; Svensson, 2003). The results also showed that females reported consistently high levels of perceived parental knowledge throughout high school whereas males reported a decrease of perceived parental knowledge with each grade, with a particularly notable decrease of parental knowledge in grade 12.

For best friend drug use, a very small increase was noted from grade 10 to 11 regarding the proportion of females reporting best friend drug use; from grade 11 to 12, similar proportions of females reported having a best friend who uses drugs. On the other hand, a large increase in the proportion of males reporting best friend drug use was found with each additional grade. In grade 12, there were twice as many males who reported best friend drug use compared to females; this result is consistent with studies which have found that males were more likely to have a best friend who uses drugs when compared to females (Brown et al., 1993; La Greca et al., 2001).

For marijuana use, the findings revealed that, overall, males used marijuana more than females. This finding also confirms previous studies that have found males to use marijuana more than females (Beman, 1995; Brecht et al., 2004; Svensson, 2003). Although similar proportions of males and females report marijuana use in grades 10 and 11, there is a substantial difference in reports of use by males and females in grade 12; specifically, there are 17% more males who report marijuana use when compared to females. Overall, the analyses revealed that gender differences were more pronounced with each passing grade which suggests that as males get older, more tend to hang out with a drug using best friend and more tend to use marijuana. At the same time as these behaviours increase, males report less parental knowledge—this suggests that, with each additional high school grade, males become less inclined to share with their parents, information about their activities, whereabouts, and friends.

These results suggests that males are at an increased risk of adopting marijuana use as they get older; this risk is exacerbated by reports of increased best friend drug use and decreasing perceived parental knowledge by males but not for females. Given that solicitation and control have been linked to more problem behaviours (Kerr et al., 2010), it is not recommended that

parents increase their monitoring efforts in order to gain more knowledge about their sons' and daughters' whereabouts, activities, and friends. Since Kerr et al. (2010) suggest that adolescent disclosure is what contributes the most to parental knowledge, it is recommended that parents learn how to encourage disclosure. Specifically, parents will need to foster open communication and trust within the context of their parent-adolescent relationship (Kerr et al., 1999). Although it is important for parents to encourage disclosure from sons and daughters, it seems even more pertinent for parents to encourage disclosure from their sons, especially as they move out of grade 10. It is possible that as sons become more involved in delinquent behaviour, they become even less inclined to disclose (Smetana, 2008). The challenge of fostering disclosure with sons is further exacerbated by findings that have reported sons generally disclose less than daughters (Smetana, 2008). It is possible that as sons become less inclined to disclose to their parent, parents may also become less inclined to foster an atmosphere that facilitates more disclosure from their sons. Thus, it will be important for parents not to give up on encouraging disclosure from their sons and thus, deter their adolescents from engaging with deviant peers and using marijuana.

The present study argued for the inclusion of both peer and family factors in the investigation of adolescent marijuana use in order to challenge assumptions, such as those espoused by Harris (1995), which posits one context (i.e., peers) is more important than the other (i.e., parents). As suggested by Bronfenbrenner (1977), investigating the adolescents' proximal influences – family and peers – can lead to a better understanding of how these two microsystems influence adolescent marijuana use. In particular, the influence of parents and best friends are of interest because these are the relationships within the microsystem that have the largest impact on the adolescent development and behaviour overall (Mcmillan, 1990). As a

result, the present study maintained that both microsystems are of importance and avoids pitting peers and parents against each other. In order to delineate how parents and best friends influence adolescent marijuana use, the present study investigated the direct and indirect effects of these proximal influences on adolescents' use of marijuana. The results confirmed the assertion that the family and peer context must be taken into account in examinations of influences on adolescent marijuana use. This study supports the need for researchers to focus less on which context provides more influence during adolescence and focus more on how each context uniquely contributes to adolescent deviant behaviour.

The results confirmed the hypothesis that perceived parental knowledge has a significant relationship to adolescent marijuana use. As highlighted by Kerr et al. (2010), previous findings claiming monitoring to be the most robust predictor of adolescent marijuana use were misinformed since the items used to construct monitoring were more representative of parental knowledge; in effect, these studies were providing support for the effect of parental knowledge on adolescent marijuana use. Taking into account the misconceptualization of monitoring, the present findings are consistent with the literature, which purport that the more adolescents report their parents to know about their whereabouts and friends, the less likely they reported marijuana use when compared to adolescents who report their parents to have less knowledge.

The results also confirmed the hypothesis that perceived parental knowledge would have a significant relationship to best friend drug use. Similar to the literature on monitoring and marijuana use, previous studies focusing on the influence of parental monitoring on adolescents' deviant peer associations have often used knowledge items to conceptualize the monitoring variable; thus, these findings actually indicated that parental knowledge, not monitoring, had a significant relationship to associating with drug using peers (Dodge et al., 2009; Kandel, 1996).

With the misconceptualization taken into account, the present findings support previous findings. In particular, adolescents who perceived their parents to have high levels of knowledge were less likely to have a drug using best friend when compared to adolescents who perceived their parents to have low levels of knowledge.

Furthermore, findings confirmed the hypothesis that best friend drug use was significantly related to adolescent marijuana use. The present results support previous research that has found deviant peers to be significantly associated to adolescent alcohol and drug use behaviours (Beman, 1995; Bahr et al., 1998; Duncan et al., 1995; Fite et al., 2006). Specifically, the present study supports claims that have found best friends to be a significant presence in an adolescents' life (Dishion et al., 1995; Dishion & Piehler, 2009; Kandel, 1996; Urberg et al., 1977). The findings showed that when adolescents reported their best friend uses drugs, they were more likely to report marijuana use when compared to adolescents who did not have a drug using best friend. One possible explanation for this relationship may stem from research that has found similarity to influence friend choice; findings have suggested that individuals often choose friends who are similar to themselves in characteristics (e.g., preferences, academics, physical appearance) and behaviours (Aboud & Mendelson; Hartup, 1989; Kandel, 1996) and that this effect of preferential choice has been found as early as childhood (Rubin, Lynch, & Coplan, 1994). The fact that adolescents who use marijuana reported best friends who use drugs suggests that adolescents who use drugs attract each other and thus, reinforce their drug using behaviours.

Finally, the mediation model confirmed the hypotheses that the significant relationship between parental knowledge and marijuana use decreased when the relationships between parental knowledge and best friend drug use, as well as best friend drug use and adolescent

marijuana use were taken into account. However, this mediation was partial in nature which supports the study's premise that both parents and peers are important factors to consider when investigating the direct and indirect effects of adolescent marijuana use. The results of the mediation model confirm previous studies that highlight the unique pathways parent and peer factors effect adolescent substance use behaviours (Brown et al., 1993; Snyder, Dishion, & Patterson, 1986) and contributes to the literature by articulating the indirect and direct effects of parental knowledge (not parental monitoring) and best friends (not peer groups) on adolescent marijuana use.

Contrary to expectation, the present study did not confirm the hypothesis for the presence of significant differences for males and females in terms of the effects of the mediation model. It was believed that for males, best friend drug use would fully mediate the relationship between perceived parental knowledge and marijuana use because best friend drug use was so prevalent when compared to females. Although partial mediation was expected for females, it was not expected for males. Even though the study found that more males reported marijuana use and best friend drug use than females, and females perceived higher levels of parental knowledge than males, the mediation model expressed similar patterns (i.e., partial mediation).

One possible suggestion for the finding of similar patterns for males and females could be that the prediction of the present study regarding gender differences was based on previous findings that highlighted effects of parents or effects of peers *alone* on adolescent delinquent behaviour. When examining studies that take into account the effects of both parents and peers on adolescent delinquency however, gender differences have usually not been found. For instance, Dodge et al.'s, (2009) study regarding the dynamic effect of parents and peers on adolescent delinquent behaviour reported no significant differences between genders although

they found males to report higher levels of marijuana use than females. These findings are similar to those reported by Bahr et al. (2005) which also found marijuana use to be higher for males.

Taken together, the findings suggest that it will be important for researchers to focus on what facilitates parents gaining knowledge and more specifically, the right amount of knowledge regarding their adolescents' whereabouts, activities, and friends. For instance, parents' ability to provide adolescents with appropriate autonomy may foster adolescents' disclosure of *enough* information that in turn creates an atmosphere of trust within the parent-adolescent relationship (Smetana, 2008). Consistent with Bronfenbrenner's (1977) belief, such an atmosphere could foster the characteristics of optimal health believed to be pertinent to this stage: a balance of discovery and direction. Thus, level of disclosure, trust and parental acceptance may be key factors to consider in future studies examining the direct and indirect effects of perceived parental knowledge and best friend drug use on marijuana use.

Implications of the Present Study

The findings of the present study have several implications for programs that aim to deter adolescents from using marijuana. First, it speaks to the need for programs to incorporate the concept of perceived parental knowledge. Programs need to educate parents on the contribution parental knowledge makes in deterring adolescents from engaging in marijuana use as well as from deterring adolescents from engaging with drug using peers. Programs can better equip parents in preventing adolescents from using marijuana by highlighting tools and mechanisms in which parents can foster an atmosphere of communication and trust that helps facilitate adolescent disclosure. Furthermore, it is crucial that programs do not encourage monitoring

activities such as solicitation and control for parents to gain more knowledge as these activities have been found to encourage more deviancy than prevent it (Kerr et al., 2010).

Secondly, programs need to highlight that both males and females benefit from higher levels of perceived parental knowledge. Programs need to emphasize that just because it is easier for daughters to disclose to their parents, it does not mean that parents should give up on fostering open communication with their sons. The findings implore programs to communicate to parents that males face an increased risk of marijuana use and engagement with drug using peers as they reach grade 12; stressing the fact that females perceive parents to have consistent levels of parental knowledge across grade and consequently, do not seem to experience the increased incidence of best friend drug use and marijuana use seen for males, may help parents understand the role of perceived parental knowledge in deterring adolescents' engagement with a drug using best friend and in marijuana use. Parents may have to work extra hard to facilitate disclosure from their sons who as they get older, seem to share less and less information about their whereabouts, friends, and activities, while at the same time, reporting marijuana use and best friend drug use more often than daughters.

Parents may deter their adolescents from using marijuana or engaging with a drug using best friend because they have fostered an atmosphere in which the adolescent understands that they are significant to the parent (Soenen et al., 2006) and thus, must feel open to share with their parents, information about their plans and friends. Such an atmosphere may facilitate parents' ability to impart teachings to their adolescent about the consequences of delinquent behaviour; it is possible that perceived parental knowledge reflects adolescents' belief that parents are mentally present which can be a result of parents responsive and authoritative parenting (Fletcher et al., 2004) exerting influence on adolescents' behaviours and friendship choices. As a result,

prevention programs should consider teaching parents how to build their presence in adolescents' life. Thus, helping parents know how to effectively talk to their adolescents about the consequences of delinquent behaviour in a way that does not exhibit control, solicitation, or disregard adolescents' autonomy will be helpful. Finding ways to establish parents' presence in adolescents' conscience would help deter adolescents from engaging with drug using peers and from using marijuana themselves.

Lastly, programs must take into account the influence of parents and peers on adolescent marijuana use. Kandel (1996) stated, and which the above results confirmed, that peers are an important direct influence on adolescent's behaviours that are typical of the norms of this developmental stage and as such, may or may not include attitudes and behaviours that approve and encourage the use of substances. On the other hand, the influence of parents must not be disregarded as evidenced by their influence on whom the adolescent chooses to befriend; this of course means that parents have the potential to impact whether or not their child will choose to associate with drug-using peers. Programs that target both parent and peer effects on adolescent marijuana use would be outfitted to be more successful than programs which target only parents or peers.

Limitations

The present study has several limitations. First of all, the study is cross-sectional which does not take into account how parents and best friends influence the trajectory of adolescent marijuana use over time. As a result, the presence or absence of reciprocal relationships cannot be inferred. For instance, it cannot be concluded that adolescent's marijuana or best friend use, impacts level of parental knowledge. Furthermore, the influence between best friend and adolescents cannot be teased apart in that the study does not reveal how adolescent's own use

impacts their best friends' drug use. Kandel (1996) has found that adolescents who use marijuana are likely to select friends who use drugs; the present study does not take into account the possibility that peers are as likely to select 'bad' friends as much as they are to be influenced by them (Simons-Morton, 2007).

A second limitation is that adolescents provided the only source of information on all measures. It is possible that having parents answer the parental knowledge questions may provide more confidence in the data and subsequent results. However, adolescent reports seem to be sufficient especially since adolescent disclosure has been found to be the best predictor of parental knowledge (Kerr et al., 2010). Research also suggests that adolescents are the best source to report on parental knowledge; findings indicate that regardless of quality of relationship, parents often overestimate the amount of knowledge they have regarding their adolescents' activities and friends (Smetana, 2008).

Also, the findings do not take into account parents' behaviours and attitudes towards drug use. Maltzman and Schweiger (1991) have found that parents' endorsement of drugs results in an increased likelihood of adolescents who exhibit drug and alcohol dependence. The present study does not take into account parents' own level of drug use and its impact on adolescent marijuana use. Moreover, it could be possible that parental knowledge, rooted in adolescents' disclosure of information, may be less likely in homes with drug using parents as these homes are often characterized by neglect and lack of open communication (Jurich et al., 1985). Future studies that take into account parents' drug using behaviours may further delineate how parents influence level of parental knowledge and adolescent marijuana use.

Additionally, adolescents were asked to report whether or not their best friend uses drugs. Perhaps having best friends report their own drug use would have strengthened the data. This

claim is supported by research that has found adolescents' perception of peers' substance use to be higher than actual use (Baumann & Ennett, 1996). However, adolescents' perception of their peers' level of drug use had as much influence on own use as peers' actual levels of drug use (Bauman & Ennett, 1996) supporting the appropriateness of using adolescents as the main source of information in the present study.

Lastly, findings from the present study should be interpreted with the following statistics in mind (Statistics Canada, 2008). First, TAYES 2005 was not able to solicit participation from Calgary, the largest metropolitan area in Alberta. Secondly, the present study was not representative of the Aboriginal population falling between 15-19 years of age in Alberta (8.3%); the sample was substantially lower with only 2.8% representing Aboriginal students. Additionally, the proportion of adolescents who reported living in two-parent household (i.e., biological parent, one biological parent and one step-parent) was 74.8%; this was slightly higher than the proportion reported by 15-19 year olds overall residing in Alberta. These limitations suggest that the sample may not be representative of all Alberta high school students and may in fact be missing a large percentage of individuals that are at most risk. Although the generalizability of the findings may be limited, the significance of the findings should not be discounted especially since it is consistent with previous research. Nonetheless, addressing these limitations in future studies would provide more confidence in the strength of the relationship and significant effects between perceived parental knowledge, best friend drug use, and marijuana use.

Concluding Remarks

The present study provides support for the powerful influence peers assert on adolescent marijuana use but cautions researchers not to count the influence of parents out. Specifically, the present study has outlined the importance of perceived parental knowledge – not monitoring – on adolescents' use of marijuana as well as adolescents' association with a best friend who uses drugs. Furthermore, the findings confirmed the importance of best friends in an adolescents' engagement in marijuana use. Lastly, the present study found that best friend drug use partially mediated the relationship between parental knowledge and marijuana use implying the powerful influence of best friends on adolescents' deviant behaviour. However, the partial mediation demonstrated that parents *still* have an impact on adolescent's behaviour even when the influence of adolescent's best friend is taken into account. Overall, the present findings emphasize the importance of parents and best friends during adolescence, providing support for Bronfenbrenner's (1977) assertions that the family and peer microsystems are important considerations in adolescent development.

Furthermore, the present findings highlight how pivotal it is for researchers to consider the mesosystem when examining adolescent behaviours (Mcmillan, 1990); these interactions cannot be ignored as they provide a much more complete picture of the pathways that contribute to adolescents' engagement in deleterious behaviours such as marijuana use. The findings of the present study informs researchers and practitioners of the unique contributions parents and peers have on adolescent marijuana use; as a result, programs developed to prevent adolescent marijuana use can potentially have more success when appropriately designed to target multiple contexts of which adolescents are a part of.

References

Aboud, F.E., & Mendelson, M.J. (1996). Determinants of friendship selection and quality: Developmental perspectives. In W.M. Bukowski, A.F., Newcomb, & W.W. Hartup (Eds.). *The company they keep: Friendship in childhood and adolescence* (pp. 87 – 112). New York, NY: Cambridge University Press.

Agnew, R. (1993). Why do they do it? An examination of the intervening mechanisms between "social control variables" and delinquency. *Journal of Research in Crime and Delinquency, 30,* 245-266. doi: 10.1177/0022427893030003001

Akers, R. L. (1998). *Social learning and social structure: A general theory of crime and deviance*. Boston, MA: Northeastern University Press.

Alberta Alcohol and Drug Abuse Commission. (2004). *Beyond abcs: Cannabis (marijuana).* Edmonton, AB: Author.

Al-Kandari, F.H., Yacoub, K., & Omu, F. (2001). Initiation factors for substance abuse. *Journal of Advanced Nursing, 34,* 78-85. doi: 10.1046/j.1365-2648.2001.3411731.x

Anderson, A.R., & Henry, C.S. (1994). Family system characteristics and parental behaviors as predictors of adolescent substance use. *Adolescence, 29*(114), 405-420.

Ary, D.V., Duncan, T.E., Duncan, S.C., & Hops, H. (1999). Adolescent problem behaviour: The influence of parents and peers. *Behaviour Research and Therapy, 37,* 217-230. doi: 10.1016/S0005-7967(98)00133-8

Bahr, S.J., Hoffman, J.P., & Yang, X. (2005). Parental and peer influences on the risk of adolescent drug use. *The Journal of Primary Prevention, 26,* 529-551. doi: 10.1007/s10935-005-0014-8

Bahr, S.J., Maughan, S.L., Marcos, A.C., & Li, B. (1998). Family, religiosity, and the risk of adolescent drug use. *Journal of Marriage and the Family, 60,* 979-992. doi: 10.2307/353639

Barber, B.K. (1992). Family, personality, and adolescent problem behaviors. *Journal of Marriage and the Family, 54,* 69-79. doi: 10.2307/353276

Barnes, G.E., Barnes, M.D., & Patton, D. (2005). Prevalence and predictors of "heavy" marijuana use in a Canadian youth sample. *Substance Use and Misuse, 40,* 1532-2491. doi: 10.1080/10826080500318558

Barnes, G.M., & Farrell, M.P. (1992). Parental support and control as predictors of adolescent drinking, delinquency, and related problem behaviours. *Journal of Marriage and the Family, 54,* 763-776. doi: 10.2307/353159

Barnes, G.M., Farrell, M.P., & Banerjee, S. (1994). Family influences on alcohol abuse and other problem behaviors among black and white adolescents in a general population sample. *Journal of Research on Adolescence, 4,* 183-201. doi: 10.1207/s15327795jra0402_2

Barnes, G.M., Farrell, M.P., & Cairns, A. (1986). Parental socialization factors and adolescent drinking behaviors. *Journal of Marriage and the Family, 1*(48), 27-36. doi: 10.2307/352225

Barnes, G.M., Reifman, A.S., Farrell, M.P., & Dintcheff, B.A. (2000). The effects of parenting on the development of adolescent alcohol misuse: A six-wave latent growth model. *Journal of Marriage and the Family, 62,* 175-186. doi: 10.1111/j.1741-3737.2000.00175.x

Baron, R.M., & Kenny, D.A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173-1182. doi: 10.1037//0022-3514.51.6.1173

Bauman, K.E., & Ennett, S.T. (1996). On the importance of peer influence for adolescent drug use: Commonly neglected considerations. *Addiction, 91,* 185-198. doi: 10.1046/j.1360-0443.1996.9121852.x

Baumrind, D. (1966). Effects of authoritative parental control on child behavior. *Child Development, 37,* 887-907. doi: 10.2307/1126611

Bell, L.G., & Bell, D.C. (2009). Effects of family connection and family individuation. *Attachment and Human Development, 11,* 471-490. doi: 10.1080/14616730903132263

Belle, D. (1989). Gender differences in children's social networks and supports. In D. Belle (Ed.), *Children's social networks and social supports* (pp. 1-12). New York, NY: Wiley.

Beman, D.S. (1995). Risk factors leading to adolescent substance abuse. *Adolescence, 30*(117), 201-209.

Berndt, T.J. (1982). The features and effects of friendship in early adolescence. *Child Development, 53,* 1447-1460. doi: 10.1111/j.1467-8624.1982.tb03466.x

Berndt, T.J. (1996). Exploring the effects of friendship quality on social development. In W.M. Bukowski, A.F., Newcomb, & W.W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence* (pp. 346 - 365). New York, NY: Cambridge University Press.

Bogenschneider, K., Wu, M., Raffaelli, M., & Tsay, J. (1998). Parent influences on adolescent peer orientation and substance use: The interface of parenting practices and values. *Child Development, 69,* 1672- 1688. doi: 10.1111/j.1467-8624.1998.tb06184.x

Borawski, E.A., Ievers-Landis, C.E., Lovegreen, L.D., & Trapl, E.S. (2003). Parental monitoring, negotiated unsupervised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health, 33,* 60-70. doi: 10.1016/S1054-139X(03)00100-9

Brecht, M.L., O'Brien, A., Mayrhauser, C.V., & Anglin, M.D. (2004). Methamphetamine use behaviours and gender differences. *Addictive Behaviours, 29,* 89-106. doi:10.1016/S0306-4603(03)00082-0

Brendgen, M., Vitaro, F., Bukowski, W.M., (1998). Affiliation with delinquent friends: Contributions of parents, self-esteem, delinquent behaviour, and rejection by peers. *Journal of Early Adolescence, 18*(3), 224-265. doi: 10.1177/0272431698018003002

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist, 32,* 513-531. doi:10.1037/0003-066X.32.7.513

Brown, B. B. (2004). Adolescents' relationships with peers. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 363–394). Hoboken, NJ: Wiley.

Brown, B.B., Eicher, S.A., & Petrie, S. (1986). The importance of peer group ("crowd") affiliation in adolescence. *Journal of Adolescence, 9,* 73-96. doi: 10.1016/S0140-1971(86)80029-X

Brown, G.G., Mounts, N., Lamborn, S.D., & Steinberg, L. (1993). Parenting practices and peer group affiliation in adolescence. *Child Development, 64,*467-482. doi: 10.1111/j.1467-8624.1993.tb02922.x

Brown, B.B., Lohr, M.J., & McClenahan, E.L. (1986). Early adolescents' perception of peer pressure. *The Journal of Early Adolescence, 6,* 139-154. doi: 10.1177/0272431686062005

Buhrmaster, D. (1996). Need fulfillment, interpersonal competence, and the developmental contexts of early adolescent friendship. In W.M. Bukowski, A.F., Newcomb, & W.W. Hartup (Eds.). *The company they keep: Friendship in childhood and adolescence* (pp. 158 – 185). New York, NY: Cambridge University Press.

Buhrmaster, D. (1990). Intimacy of friendship, interpersonal competence, and adjustment during preadolescence and adolescence. *Child Development, 61,* 1101-111. doi: 10.1111/j.1467-8624.1990.tb02844.x

Chilcoat, H.D. & Anthony, J.C. (1996). Impact of parent monitoring on initiation of drug use through late childhood. *Journal of American Academy of Child and Adolescent Psychiatry, 35,* 91-100. doi:10.1097/00004583-199601000-00017

Childs, K.K., Sullivan, C.J., & Gulledge, L.M. (2011). Delinquent behavior across adolescence: Investigating the shifting salience of key criminological predictors. *Deviant Behavior, 32,* 64-100. doi: 10.1080/01639621003748498

Claes, M., Lacourse, E., Ercolani, A., Pierro, A., Leone, L., & Presaghi, F. (2005). Parenting, peer orientation, drug use, and antisocial behaviour in late adolescence: A cross-national study. *Journal of Youth and Adolescence, 34,* 401-411. doi: 10.1007/s10964-005-7258-8

Coombs, R.H., & Landsverk, J. (1988). Parenting styles and substance use during childhood and adolescence. *Journal of Marriage and the Family, 50*(2), 473-482. doi: 10.2307/352012

Cohen, J. M. (1977). Sources of peer group homogeneity. *Sociology of Education, 50*(4), 227-241. doi: 10.2307/2112497

Cottrell, L., Li, X., Harris, C., D'Alessandri, D., Atkins, M., Richardson, B., & Stanton, B. (2003). Parent and adolescent perceptions of parental monitoring and adolescent risk involvement. *Parenting Science and Practice, 3,* 179-195. doi**:** 10.1207/S15327922PAR0303_01

Crosnoe, R. & Cavanagh, S.E. (2010). Families with children and adolescents: A review, critique, and future agenda. *Journal of Marriage and Family, 72,* 594-611. doi: 10.1111/j.1741-3737.2010.00720.x

Darling, N. (2007). Ecological systems theory: The person in the center of the circles. *Research in Human Development, 4,* 203-217. doi: 10.1080/15427600701663023

Denton, R.E. & Kampfe, C.M. (1994). The relationship between family variables and adolescent substance abuse: A literature review. *Adolescence, 29*(114), 475-495.

Dishion, T.J., Capaldi, D., Spracklen, K.M., & Li, F. (1995). Peer ecology of male adolescent drug use. *Development and Psychopathology, 7,* 803-824. doi: 10.1017/S0954579400006854

Dishion, T.J., Capaldi, D.M., & Yoerger, K. (1999). Middle childhood antecedents to progressions in male adolescent substance use: An ecological analysis of risk and protection. *Journal of Adolescent Research, 14,* 175-205. doi: 10.1177/0743558499142003.

Dishion, T.J., & McMahon, R.J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review, 1,* 61-75. doi:10.1023/A:1021800432380

Dishion, T.J., & Piehler, T.F. (2009). Deviant by design: Peer contagion in development, interventions, and school. In K.H., Rubin, W.M. Bukowskit, & B. Laursen (Eds.)., *Handbook of peer interactions, relationships, and groups* (pp. 589 – 602). New York, NY: The Guildford Press.

Dodge, K.A., Malone, P.S., Lansford, J.E., Miller, S., Pettit, G.S., & Bates, J.E. (2009). A dynamic cascade model of the development of substance-use onset [Monograph]. *Developmental Psychology, 74*(3). doi: 10.1111/j.1540-5834.2009.00528.x

Duncan, T.E., Tildesley, E., Duncan, S.C., & Hops, H. (1995). The consistency of family and peer influences on the development of substance use in adolescence. *Society for the Study of Addiction to Alcohol and Other Drugs, 90,* 1647-1660. doi: 10.1046/j.1360-0443.1995.901216477.x

Eichelsheim, V.I., Buist, K.L., Dekovic, M., Wissink, I.B., Frijns, T., van Lier, P.A., … Meeus, W.H. (2010). Associations among the parent-adolescent relationship, aggression and delinquency in different ethnic groups: A replication across two Dutch samples. *Social Psychiatry and Psychiatric Epidemiology, 3,* 293-300. doi: 10.1007/s00127-009-0071-z

Ennett, S.T., & Bauman, K.E. (1994). The contribution of influence and selection to adolescent peer group homogeneity: The case of adolescent cigarette smoking. *Journal of Personality and Social Psychology, 67,* 653-663. doi: 10.1037//0022-3514.67.4.653

Epstein, J.L. (1983). Examining theories of adolescent friendships. In J.L. Epstein & N. Karweit (Eds.), *Friends in school: Patterns of selection and influence* (pp.39-58). New York, NY: Academic Press.

Fagan, A.A., Van Horn, M.L., Hawkins, J.D., & Arthur, M.W. (2007). Gender similarities and differences in the association between risk and protective factors and self-reported serious delinquency. *Prevention Science, 8,* 115-124. doi:10.1007/s11121-006-0062-1

Fletcher, A.C., Steinberg, L., Williams-Wheeler, M. (2004). Parental influences on adolescent problem behaviour: Revisiting Stattin and Kerr. *Child Development, 75*(3), 781-796. doi: 10.1111/j.1467-8624.2004.00706.x

Fite, P.J., Colder, C.R., & O'Connor, R.M. (2006). Childhood behaviour problem and peer selection and socialization: Risk for adolescent alcohol use. *Addictive Behaviours, 31,* 454-459. doi:10.1016/j.addbeh.2005.09.015

Galambos, N.L., Barker, E.T., & Almeida, D.M. (2003). Parents do matter: Trajectories of change in externalizing and internalizing problems in early adolescence. *Child Development, 74*(2), 578-594. doi: 10.1111/1467-8624.7402017

Griffin, K.W., Scheier, L.M., & Nichols, T.R. (2002). Factors associated with regular marijuana use among high school students: A long-term follow-up study. *Susbtance Use and Misuse, 37,* 225-238. doi: 10.1081/JA-120001979

Government of Alberta, Education. (2009). *Accountability pillar results for annual education results report (AERR)* (Report Version 1.0). Retrieved from http://education.alberta.ca/media/1119131/2009octprovincereport.pdf

Grotevant, H.D., & Cooper, C.R. (1986). Individuation and family relationships: A perspective on individual differences in the development of identity and role taking skill in adolescence. *Human Development, 29,* 82-100. doi: 10.1159/000273025

Hair, E.C., Moore, K.A., Garrett, S.B., Ling, T., & Cleveland, K. (2008). The continued importance of quality parent-adolescent relationships during late adolescence. *Journal of Research on Adolescence, 18,* 187-200. doi:10.1111/j.1532-7795.2008.00556.x

Hamm, J.V. (2000). Do birds of a feather flock together? The variable bases for African American, Asian American, and European American adolescents' selection of similar friends. *Developmental Psychology, 36,* 209-219. doi:10.1037//0012-1649.36.2.209

Harris, J.R. (1995). Where is the child's environment? A group socialization theory of development. *Psychological Review, 102*(3), 458-489.

Harris, J.R. (2000). Socialization, personality development and the child's environments: Comment on Vandell (2000). *Developmental Psychology, 36*(6), 711-723. doi: 10.1037//0012-1649.36.6.711

Harrod, N.R., & Scheer, S.D. (2005). An exploration of adolescent emotional intelligence in relation to demographic characteristics. *Adolescence, 40*(159), 503-512.

Hartup, W.W. (1989). Social relationships and their developmental significance. *American Psychologist, 44,* 120-126. doi: 10.1037//0003-066X.44.2.120

Hill, J.P. (1980). The family. In M. Johnson (Ed.), *Toward adolescence: The middle school years.* Chicago, IL: University of Chicago Press.

Hoffman, J.P. & Johnson, R.A. (1998). A national portrait of family structure and adolescent drug use. *Journal of Marriage and the Family, 60*(3), 633-645. doi:10.2307/353534

Hollist, D.R., Hughes, L.A., & Schaible, L.M. (2009). Adolescent maltreatement, negative emotion, and delinquency: An assessment of general strain theory and family based strain. *Journal of Criminal Justice, 37,* 379-387. doi: 10.1016/j.jcrimjus.2009.06.005

Howes, C. (1983). Patterns of friendship. *Child Development, 54*(4), 1041-1053. doi: 10.1111/1467-8624.ep12432775

Jurich, A.P., Polson, C.J., Jurich, J.A., & Bates, R.A. (1985). Family factors in the lives of drug users and abusers. *Adolescence, 20*(77), 143-159.

Kandel, D.B. (1996). The parental and peer contexts of adolescent deviance: An algebra of interpersonal influences. *Journal of Drug Issues, 26*(2), 289-315.

Kandel, D.B., & Andrews, K. (1987). Process of adolescent socialization by parents and peers. *The International Journal of the Addictions, 22,* 319-342.

Kerr, M., & Stattin, H. (2000). What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring. *Developmental Psychology, 36,* 366-380. doi: 10.1037/0012-1649.36.3.366

Kerr, M., Stattin, H., & Burk, W.J. (2010). A reinterpretation of parental monitoring in longitudinal perspective. *Journal of Research on Adolescence, 20,* 39-64. doi:10.1111/j.1532-7795.2009.00623.x

Kerr, M., Stattin, H., & Trost, K. (1999). To know you is to trust you: parents' trust is rooted in child disclosure of information. *Journal of Adolescence,22*, 737-752. doi:10.1006/jado.1999.0266

Kilpatrick, D.G., Acierno, R., Saunders, B., Resnick, H.S., Best, C.L., & Schnurr, P. (2000). Risk factors for adolescent substance abuse and dependence: Data from a national sample. *Journal of Consulting and Clinical Psychology, 68*(1), 19-30. doi: 10.1037//0022-006X.68.1.19

Kobus, K., & Henry, D.B. (2009). Interplay of network position and peer substance use in early adolescent cigarette, alcohol and marijuana use. *The Journal of Early Adolescence, 30,* 225-245. doi: 10.1177/0272431609333300

Lac, A., & Crano, W.D. (2009). Monitoring matters: Meta analytic review reveals the reliable linkage of parental monitoring with adolescent marijuana use. *Perspectives on Psychological Science, 4,* 578-586. doi: 10.1111/J.1745-6924.2009.01166.x

La Greca, A.M., Prinstein, M., & Fetter, M.D. (2001). Adolescent peer crowd affiliation: Linkages with health-risk behaviors and close friendships. *Journal of Pediatric Psychology, 26,* 131-143. doi: 10.1093/jpepsy/26.3.131

Laird, R.D., Pettit, G.S., Bates, J.E., & Dodge, K.A. (2003). Parents' monitoring-relevant knowledge and adolescents' delinquent behaviour: Evidence of correlated developmental changes and reciprocal influences. *Child Development, 74,* 752-768. doi:10.1111/1467-8624.00566

Lahey, B.B., Van Hulle, C.A., D'Onofrio, B.M., Rodgers, J.L., & Waldman, I.D. (2008). Is parental knowledge of their adolescent offspring's whereabouts and peer associations spuriously associated with offspring delinquency? *Journal of Abnormal Child Psychology, 36,* 807-823. doi: 10.1007/s10802-008-9214-z

Latendresse, S.J., Rose, R.J., Viken, R.J., Pulkkinen, L., Kaprio, J., & Dick, D.M. (2008). Parenting mechanisms in links between parents' and adolescents' alcohol use behaviors. *Alcoholism: Clinical and Experimental Research, 32,* 322-330. doi: 10.1111/j.1530-0277.2007.00583.x

Maccoby, E.E. (1990). Gender and relationships: A developmental account. *American Pscyhologist, 45,* 513-520. doi: 10.1037//0003-066X.45.4.513

Maltzman, I., & Schweiger, A. (1991). Individual and family characteristics of middle class adolescents hospitalized for alcohol and drug abuse. *British Journal of Addiction, 86,* 1435-1447. doi:10.1111/j.1360-0443.1991.tb01729.x

Marcia, J.E. (2002). Adolescence, identity, and the Bernardone Family. *Identity: An International Journal of Theory and Research, 2,* 199-209. doi: 10.1207/S1532706XID0203_01

Maxwell, K.A. (2002). Friends: The role of peer influence across adolescent risk behaviours. *Journal of Youth and Adolescence, 31,* 267-277. doi: 10.1023/A:1015493316865

McCord, J. (1990). Problem behaviors. In S.S. Feldman & G.R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp.414-430). Cambridge, MA: Harvard University Press.

MacKinnon, D. P., & Dwyer, J. H. (1993). Estimating mediated effects in prevention studies. Evaluation Review, 17, 144-158. doi: 10.1177/0193841X9301700202

Mcmillan, B.W. (1990). An ecological perspective on individual human development. *Early Child Development and Care, 55,* 33-42. doi:10.1080.0300443900550106

Murray, J., & Farrington, D.P. (2010). Risk factors for conduct disorder and delinquency: Key findings from longitudinal studies. *The Canadian Journal of Psychiatry, 55*(10), 633-642.

Muus, R.E. (1996). Urie Bronfenbrenner's Ecological Perspective of Human Development. In *Theories of adolescence* (6th- ed.) (pp. 312 – 338). New York, NY: McGraw-Hill.

Nash, S.G., McQueen, A., & Bray, J.H. (2005). Pathways to adolescent alcohol use: family environment, peer influence, and parental expectations. *Journal of Adolescent Health, 37,* 19-28. doi: 10.1016/j.jadohealth.2004.06.004

Palmqvist, R., & Santavirta, N. (2006). What friends are for: The relationships between body image, substance use, and peer influence among Finnish adolescents. *Journal of Youth and Adolescence, 35,* 203-217. doi: 10.1007/s10964-005-9017-2

Pardeck, J.A., & Pardeck, J.T. (1990). Family factors related to adolescent autonomy. *Family Therapy, 17*(3), 223-231.

Patterson, G.R. & Stouthamer-Loeber, M. (1984). The correlation of family management practise and delinquency. *Child Development, 55,* 1299-1307. doi: 10.2307/1129999

Pepler, D.J., Jiang, D., Craig, W.M., & Connolly, J. (2010). Developmental trajectories of girls' and boys' delinquency and associated problems. *Journal of Abnormal Child Psychology, 38,* 1033-1044. doi: 10.1007/s10802-010-9389-y

Peters, J.F. (1994). Gender socialization of adolescents in the home: Research and discussion. *Adolescence, 29*(116), 913-935.

Petraitis, J., Flay, B.R., & Miller, T.Q. (1995). Reviewing theories of adolescent substance use: Organizing pieces in the puzzle. *Psychological Bulletin, 117,* 67-86. doi: 10.1037/0033-2909.117.1.67

Reitz, E., Prinzie, P., Dekovic, M., & Buist, K.L. (2007). The role of peer contacts in the relationship between parental knowledge and adolescents' externalizing behaviours: A latent growth curve modeling approach. *Journal of Youth and Adolescence, 36,* 623-634. doi: 10.1007/s10964-006-9150-6

Rubin, K.H., Lynch, D., & Coplan, R. (1994). "Birds of a feather...": Behavioural concordances and preferential personal attraction in children. *Child Development, 65,* 1778-1785. doi: 10.1111/j.1467-8624.1994.tb00848.x

Sieving, R.E., Perry, C.L., Williams, C.L. (2000). Do friendships change behaviours, or do behaviours change friendships? Examining paths of influence in young adolescents' alcohol use. *Society for Adolescent Medicine, 26,* 27-35. doi: 10.1016/S1054-139X(99)00056-7

Simons, R.L. & Robertson, J.F. (1989). The impact of parenting factors, deviant peers, and coping style upon adolescent drug use. *Family Relations, 38*(3), 273-281. doi: 10.2307/585052

Simons-Morton, B. (2007). Social influences on adolescent substance use. *American Journal of Health Behaviors, 31*(6), 672-684.

Smetana, J. (2008). "It's 10 O'clock: Do you know where your children are?" Recent advances in understanding parental monitoring and adolescents' information management. *Society for Research in Child Development, 2,* 19-25. 10.1111/j.1750-8606.2008.00036.x

Snyder, J., Dishion, T.J., & Patterson, G.R. (1986). Determinants and consequences of associating with deviant peers during preadolescence and adolescence. *Journal of Early Adolescence, 6,* 29-43. doi: 10.1177/0272431686061003

Soenens, B., Vansteenkiste, M., Luyckx, K., & Goosens. L. (2006). Parenting and adolescent problem behaviour: An integrated model with adolescent self-disclosure and perceived parental knowledge as intervening variables. *Developmental Psychology, 42,* 305-318. doi: 10.1037/0012-1649.42.2.305

Statistics Canada. 2008. *2006 Community Profiles*: *2006 Census* (Statistics Canada Catalogue No. 92-591-XWE). Retrieved from http://www12.statcan.gc.ca/census-recensement/2006/dp-pd/fs-fi/index.cfm?Lang=ENG&TOPIC_ID=2&PRCODE=48

Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development, 71,* 1072-1085. doi: 10.1111/1467-8624.00210

Steinberg, L. (1990). Autonomy, conflict, and harmony in the family relationship. In E. Aries, *Adolescent behavior: Readings and interpretations* (pp. 352-371). New York, NY: McGraw-Hill/Dushkin.

Stephenson, A.L. & Henry, C.S (1996). Family characteristics and adolescent substance use. *Adolescence, 31*(121), 59-77.

Sussman, S., Pokhrel, P., Ashmore, R.D., & Brown, B.B. (2007). Adolescent peer group identification and characteristics: A review of the literature. *Addictive Behaviors, 32,* 1602-1627. doi: 10.1016/j.addbeh.2006.11.018

Svensson, R. (2003). Gender differences in adolescent drug use: The impact of parental monitoring and peer deviance. *Youth and Society, 34,* 300-329. doi: 10.1177/0044118X02250095

Thorne, C.R. & DeBlassie, R.R. (1985). Adolescent substance abuse. *Adolescence, 20*(78), 335-346.

Tobler, A.L., & Komro, K.A. (2010). Trajectories or parental monitoring and communication and effects on drug use among urban young adolescents. *Journal of Adolescent Health, 46,* 560-568. doi: 10.1016/j.jadohealth.2009.12.008

Tomori, M. (1994). Personality characteristics of adolescents with alcoholic parents. *Adolescence, 29*(116), 949-959.

Urberg, K.A., Degirmencioglu, S.M., & Pilgrim, C. (1977). Close friend and group influence on adolescent cigarette smoking and alcohol use. *Developmental Psychology, 33,* 834-844. doi: 10.1037//0012-1649.33.5.834

Vakalahi, H.F. (2001). Adolescent substance use and family-based risk and protective factors: A literature review. *Journal of Drug Education, 31,* 29-46. doi: 10.2190/QP75-P9AR-NUVJ-FJCB

Vandell, D. L. (2000). Parents, peer groups, and other socializing influences. *Developmental Psychology, 36,* 699-710. doi: 10.1037/0012-1649.36.6.699

Wild, T.C., Wolfe, J., & Currie, C. (2006). *The Alberta Youth Experience Survey 2005 (TAYES).* Edmonton, AB: Author.

Wills, T.A., & Yaeger, A.M. (2003). Family factors and adolescent substance use: Models and mechanisms. *Current Directions in Psychological Science, 12*(6), 222-226.

Appendix A

The Alberta Youth Experience Survey: Purpose and Development

TAYES 2005 was developed to meet AADAC's mandate of using research in informing their understanding and monitoring of substance use and gambling behaviours in the province of Alberta. Data solicited adolescent reports of their substance use patterns (alcohol, drugs, and cigarettes) and gambling behaviours. Adolescents were required to answer questions regarding family practices and atmosphere, their engagement with pro-drug or pro-gambling peers, as well as their own perceptions and attitudes about these behaviours.

Survey Development

The aim of the survey was developed with two goals in mind; to examine the contributing factors of substance use and gambling behaviours in Alberta's junior high and high school students as well as to outline any visible patterns in these problem behaviours by linking findings to the findings of TAYES 2002 (AADAC, 2006). The aim of TAYES 2005 was to answer the following questions:

1. What proportion of Alberta students in grades 7 through 12 use alcohol, tobacco, and illicit drugs and participate in gambling activities?
2. How often do Alberta adolescents use alcohol, tobacco, and illicit drugs and participate in gambling activities?
3. What is the prevalence of harmful use of substances and gambling?
4. Are there patterns of alcohol, tobacco, and illicit drug use and gambling behaviour associated with gender, region, and grade?
5. Do users' and non-users' perception about substance use, themselves, and their environment differ?

6. Do users' and non users' perceptions about substance use, themselves, and their environment differ?
7. Do users and non-users differ in school connectedness, parental supervision, and choice of social activities?

Two modules were designed to accommodate data collection. TAYES Module A consisted of 201 items and was given to junior high school students (Gr. 7 to 9); TAYES Module B consisted of an additional 57 items and given to high school students (Gr. 10 to 12). Items were developed by cross-referencing TAYES 2002 and other surveys related to drug use (e.g., national youth surveys). Before administering the modules to students, each module was given to youth currently receiving services from AADAC.

TAYES 2005 Recruitment

The schools in which students were recruited from were chosen using a "single-stage stratified cluster sample design with selection proportional to school size" (AADAC, 2006, p. 10). Alberta was first divided into five regions wherein 27 school divisions were approached; of these 27 school divisions, 12 consented to participate in the study. Subsequently 32 schools from these 27 school divisions were solicited for participation. Of these 32 schools, 19 agreed to have their students complete the survey. Unfortunately, sampling issues arose. First, a large urban centre did not grant permission to access their students while another only granted access to a small number of high school students.

Once schools were identified, researchers began to solicit parental consent in addition to establishing protocol to ensure confidentiality and anonymity for all participants was protected. The surveys were then administered between October 2005 and March 2006; students whose parental consent completed either Module A or B (depending on grade) while students whose

parents did not provide consent completed a mock interview. Students completed the self-administered surveys in class. All surveys were electronically scanned; 11 percent of all surveys were inspected afterwards to ensure that scanning was done appropriately. Surveys that did not have valid responses for age and/or sex, as well as surveys in which students reported the use of a fictitious drug (andechromes), the use of 11 or more of 13 illicit drug 40 or more times in the past year, or if no responses were recorded for all the drug questions. An analysis ensured that excluded cases did not represent a specific portion of students and was therefore, evenly distributed (AADAC, 2006). Data was then weighted using:

> a single-stage (school) stratified (by region) cluster sample design with selection proportional to school size; weight differences in official and actual student enrolment, student non-response, and the discrepancy between students who could have been given the opportunity to participate in each region and those given the opportunity to participate in each region (AADAC, 2006, p.11).

After relative weight was calculated, TAYES 2005 had 3, 915 valid questionnaires.

TAYES THE ALBERTA YOUTH EXPERIENCE SURVEY 2005

Module B (Grades 10-12)

AADAC

Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

TAYES THE ALBERTA YOUTH EXPERIENCE SURVEY 2005

Introduction

This survey is designed to measure adolescent alcohol, tobacco, other drug and gambling use in Alberta. We DO NOT want to know about individual students. DO NOT write your name anywhere on this survey. The survey is totally anonymous. **No one but you will know how you answer the questions.** Please answer the questions honestly.

Your participation in this survey is completely voluntary. If you do not feel comfortable answering any question, or if you do not feel you can answer it honestly, leave it blank. If you do not wish to take the survey at all, please work quietly at your seat while it is completed by other students.

Directions

- Please DO NOT write your name anywhere on this survey.
- When you have completed your survey, place it in the envelope at your teacher's desk.
- Unless otherwise specified all the questions can only have one answer.
- This survey will be scanned so please shade the bubble completely as shown:

Like this: ● Not like this: ⊗ or this ✓

Thank you for your participation!

AADAC

Alberta Alcohol and Drug Abuse Commission
An Agency of the Government of Alberta

About You:

1. **How old are you?**
   - O… 10 years or younger
   - O… 11 years
   - O… 12 years
   - O… 13 years
   - O… 14 years
   - O… 15 years
   - O… 16 years
   - O… 17 years
   - O… 18 years
   - O… 19 years
   - O… 20 years or older

2. **In what grade are you?**
   - O… Grade 7
   - O… Grade 8
   - O… Grade 9
   - O… Grade 10
   - O… Grade 11
   - O… Grade 12

3. **How many times have you moved to a different home in the last 5 years?**
   - O… Never
   - O… Once
   - O… 2 or 3 times
   - O… 4 or 5 times
   - O… 6 to 9 times
   - O… 10 times or more

4. **With whom are you currently living?**
   - O… Both biological parents
   - O… Biological mother only
   - O… Biological father only
   - O… One biological parent and one step-parent
   - O… Shared custody
   - O… Adoptive parent(s)
   - O… Foster parent(s)
   - O… Other relatives
   - O… Living in a group home
   - O… Living on my own or with a friend

5. **Are you male or female?**
   O… Male O… Female

6. **Were you born in Canada?**
   O… Yes O… No

7. **Which of the following best describes your ethnic background?** If you have multiple ethnic backgrounds please shade all that apply.
   - O… African
   - O… Australian
   - O… Eastern European
   - O… European
   - O… First Nation
   - O… Latin or South American
   - O… Metis
   - O… Scandinavian (e.g. Danish)
   - O… South Asian (e.g. Indian)
   - O… Southeast/East Asian (e.g. Korean)
   - O… Other
   - O… Don't Know

8. **Overall, what marks do you usually get in school?**
   - O… A – (80% to 100%)
   - O… B – (67% to 79%)
   - O… C – (60% to 66%)
   - O… D – (50% to 59%)
   - O… Less than D – (below 50%)

9. **Compared to other students in your school, how do you rate yourself in the school work you do?**
   - O… Far below average
   - O… Below average
   - O… Slightly below average
   - O… Average
   - O… Slightly above average
   - O… Above average
   - O… Far above average

10. **On average, how much time do you spend doing homework each week outside of school?**
    - O… No homework at all
    - O… Less than 1 hour per week
    - O… About 1 to 2 hours
    - O… About 3 to 4 hours
    - O… About 5 to 6 hours per week
    - O… About 7 or more hours per week

11. **Do you have access to the internet?**
    O… Yes O… No

12. **Some people like school very much while others don't. How do you feel about going to school?**
    - O… I like school very much
    - O… I like school quite a lot
    - O… I like school to some degree
    - O… I don't like school very much
    - O… I don't like school at all

13. **Not everyone expects to go as far in school as they would like. How likely is it that you will stay in school until you graduate?**
    - O… Not at all likely
    - O… Not very likely
    - O… Fairly likely
    - O… Very likely

14. **At school, how worried are you that someone will harm you, threaten you, or take something from you?**
    - O… Very worried
    - O… Somewhat worried
    - O… Not very worried
    - O… Not at all worried

TAYES 2005 Module B 4 ID: 00000

For question 15, please tell us whether you agree or disagree with the following statements:

		Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
15. a.	**I feel safe in my school.**	O	O	O	O
b.	**I feel close to people at this school.**	O	O	O	O
c.	**I feel like I am a part of this school.**	O	O	O	O
d.	**Most teachers in my school are excellent.**	O	O	O	O
e.	**Most classes offered in my school are challenging.**	O	O	O	O

16. **During the last 5 years, how many times have you changed schools?** Do not include changing from elementary or middle school to high school.
- O…Never
- O…Once
- O…2 times
- O…3 times
- O…4 or more times

17. **During the last 4 weeks, how often have you gone to school, but skipped a class when you weren't supposed to?**
- O…Never in the last 4 weeks
- O…1 or 2 times
- O…3 to 5 times
- O…6 to 10 times
- O…11 to 20 times
- O…More than 20 times

18. **On average, how many hours a week do you spend working for pay?**
- O…5 hours or less
- O…6 to 10 hours
- O…11 to 15 hours
- O…16 to 20 hours
- O…More than 20 hours
- O…Don't work for pay

19. **Raves are large all-night dance parties. How often in the last 12 months, have you been to a rave?**
- O…Never
- O…Once
- O…2 times
- O…3 or more times

20. **In the last 12 months have you attended an outdoor party (such as a bush party, beach party, etc.) where there was consumption of alcohol and/or drugs?**

O…Yes O…No

Tobacco:

21. **Have you ever smoked every day for at least 7 days in a row?**

O…Yes O…No

22. **Have you ever tried any of the following?** Fill in all that apply.
- O…Smoking cigars or pipe tobacco
- O…Smoking bidis
- O…Using chewing tobacco
- O…Using snuff
- O…I have not tried these things

23. **How old were you when you first smoked your first whole cigarette?**
- O…I have never smoked a whole cigarette
- O…Don't know
- O…8 or younger
- O…9
- O…10
- O…11
- O…12
- O…13
- O…14
- O…15 or older

24. **On how many of the last 30 days did you smoke one or more cigarettes?**
- O…None
- O…1-5
- O…6-10
- O…11-20
- O…21-29
- O…30 (every day)

25. **Thinking back over the last 30 days, on the days that you smoked, how many cigarettes did you usually smoke each day?**
- O…Did not smoke in last 30 days
- O…5 or less
- O…6-10
- O…11-15
- O…16-20
- O…21-25
- O…More than 25

26. **How easy or difficult would it be for you to get cigarettes if you wanted some?**
- O…Impossible
- O…Very difficult
- O…Difficult
- O…Easy
- O…Very easy
- O…Don't know

28. **Have you ever tried to quit smoking?**
- O…I have never smoked
- O…I have only smoked a few times
- O…I have never tried to quit
- O…I have tried to quit once
- O…I have tried to quit 2 or 3 times
- O…I have tried to quite 4 or 5 times
- O…I have tried to quit 6 or more times

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27. **Where do you usually get your cigarettes?** Fill in all that apply.

- O… Do not smoke
- O… Vending machine
- O… Buy them myself at store
- O… Buy from someone
- O… Ask someone to buy for me
- O… Get from friends
- O… Get from parents
- O… Get from brother/sister

Alcohol:

*For the questions in this section a "drink" means a can or bottle of beer or wine cooler, a 4 ounce glass of wine, a shot of liquor (like whiskey, vodka, or tequila), or a mixed drink. If you have only had a sip or taste of someone else's drink, or drank wine in a religious service, please indicate that you "**never drank alcohol in lifetime**".*

31. **In the last 12 months, how often did you drink ALCOHOL - liquor (rum, whiskey, etc), wine, beer, coolers?**

- O… Drank only at special events (for example, Christmas or at weddings)
- O… Had a sip of alcohol to see what it's like
- O… Once a month or less often
- O… 2 or 3 times a month
- O… Once a week
- O… 2 or 3 times a week
- O… 4 or 5 times a week
- O… Almost every day - 6 or 7 times a week
- O… Drank, but not in the last 12 months
- O… Never drank alcohol in lifetime

32. **When (if ever) did you first drink more than a sip of alcohol?**

- O… Grade 4 or before
- O… Grade 5
- O… Grade 6
- O… Grade 7
- O… Grade 8
- O… Grade 9
- O… Grade 10
- O… Grade 11
- O… Grade 12
- O… Never drank alcohol in lifetime

33. **How many times in th drinking alcohol mad had so much to drink what you wanted to d**

- O… Once
- O… 2 times
- O… 3 times
- O… 4 times
- O… 5 or more times
- O… Did not drink alco
- O… Not been drunk ir
- O… Don't drink alcoh

34. **How many times in th had five or more drin occasion?**

- O… Once
- O… 2 times
- O… 3 times
- O… 4 times
- O… 5 or more times
- O… Did not drink alco
- O… Did not have five the same occasio
- O… Don't drink alcoh

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For the questions in this section a "drink" means a can or bottle of beer or wine cooler, a 4 ounce glass of wine, a shot of liquor (like whiskey, vodka, or tequila), or a mixed drink. If you have only had a sip or taste of someone else's drink, or drank wine in a religious se

35. **Have you ever seen a doctor or been in the hospital because you had been drinking alcohol?**

O…Yes O…No O…Don't drink alcohol

36. **Have you ever been warned by police because of your use of alcohol?**

O…Yes O…No O…Don't drink alcohol

37. **How easy or difficult would it be for you to get alcohol if you wanted some?**

O…Impossible O…Easy
O…Very difficult O…Very easy
O…Difficult O…Don't know

38.a. **How often do you have a drink containing alcohol?**

O…Never O… 2-3 times a week
O…Monthly or less O… 4 or more times a week
O…2-4 times a month

38.b. **How many drinks do you have on a typical day when you are drinking?**

O…1 to 2 drinks O… 7 to 9 drinks
O…3 to 4 drinks O… 10 or more drinks
O…5 to 6 drinks

		Never	Less than once a month	About once a month	About once a week	Daily or almost daily
38.c.	**How often do you have 6 or more drinks on one occasion?**	O	O	O	O	O
38.d.	**How often during the PAST YEAR have you found that you were not able to stop drinking once you had started?**	O	O	O	O	O
38.e.	**How often during the PAST YEAR have you failed to do what was normally expected from you because of drinking?**	O	O	O	O	O
38.f.	**How often during the PAST YEAR have you needed a drink of alcohol in the morning to get yourself going after a heavy drinking session?**	O	O	O	O	O
38.g.	**How often during the PAST YEAR have you had a feeling of guilt or remorse after drinking?**	O	O	O	O	O
38.h.	**How often during the PAST YEAR have you been unable to remember what happened the night before because you had been drinking?**	O	O	O	O	O

38.i. **Have you or someone else been injured as a result of <u>your</u> drinking?**

O…No
O…Yes, but not in the last 12 months
O…Yes, in the last 12 months

38.j. **Has a relative or friend or doctor or other health care worker been concerned about <u>your</u> drinking or suggested you cut down?**

O…No
O…Yes, but not in the last 12 months
O…Yes, in the last 12 months

39. **Have you been in a treatment program during the LAST 12 MONTHS because of your alcohol use?**

O…No
O…Yes, but not in the last 12 months
O…Yes, in the last 12 months

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Other Drugs:

40.	**In the last 12 months, how often did you…**	1 to 2 times	3 to 5 times	6 to 9 times	10 to 19 times	20 to 39 times	40 or more times	Used, but not in last 12 months	Never used in lifetime	Don't know what this is
a.	Use CANNABIS (also known as marijuana, "weed", "grass", "pot", hashish, "hash", hash oil, etc.)?	O	O	O	O	O	O	O	O	O
b.	Sniff GLUE (for example, airplane glue, contact cement, etc.) in order to get high?	O	O	O	O	O	O	O	O	O
c.	Sniff SOLVENTS (such as nail polish remover, paint thinner, gasoline, etc.) in order to get high?	O	O	O	O	O	O	O	O	O
d.	Use BARBITUATES (such as Seconol, also known as "barbs", "rainbows", etc.) without a prescription or without a doctor telling you to take them?	O	O	O	O	O	O	O	O	O
e.	Use HEROIN (also known as "H", "junk", "smack", etc.)?	O	O	O	O	O	O	O	O	O
f.	Use METHAMPHETAMINES or "speed"?	O	O	O	O	O	O	O	O	O
g.	Use CRYSTAL METH or "ice"?	O	O	O	O	O	O	O	O	O
h.	Use COCAINE (also known as "coke", "snow", "snort", "blow", etc.)?	O	O	O	O	O	O	O	O	O
I.	Use cocaine in the form of CRACK?	O	O	O	O	O	O	O	O	O
j.	Use STIMULANTS other than cocaine (such as diet pills, also known as "uppers", "bennies", "dexies", etc.) without a prescription or without a doctor telling you to take them?	O	O	O	O	O	O	O	O	O
k.	Use TRANQUILLIZERS other than cocaine (such as Valium, Librium, also known as "tranqs", "downers", etc.) without a prescription or without a doctor telling you to take them?	O	O	O	O	O	O	O	O	O
p.	Use OXYCONTIN (also known as "oxy", "OC")?	O	O	O	O	O	O	O	O	O
q.	Use ADRENOCHROMES (also known as "wagon wheels")?	O	O	O	O	O	O	O	O	O

41. **Sometimes doctors give medicine such as Ritalin to students who are hyperactive or have problems concentrating in school. This is sometimes called Attention Deficit Disorder. In the last 12 months, how often did you use RITALIN <u>with a prescription</u> or because a doctor told you to take it?**

O…1 to 2 times
O…3 to 5 times
O…6 to 9 times
O…10 to 19 times
O…20 to 39 times
O…40 or more times
O…Used medically, but not in last 12 months
O…Never used in lifetime
O…Don't know what Ritalin is

42. **In the last 12 months have you used an illicit drug by injection or needle?**

O…Yes O… No

43. **In the last 12 months, how often did you use RITALIN <u>without a prescription</u> or without a doctor telling you to take them?**

O… 1 to 2 times
O… 3 to 5 times
O… 6 to 9 times
O… 10 to 19 times
O… 20 to 39 times
O… 40 or more times
O… Used medically, but not in last 12 months
O… Never used in lifetime
O… Don't know what Ritalin is

44. **Have you ever used STEROIDS, body builders/performance builders (e.g., testosterone and other androgens, durabolin, growth hormones, etc.) to increase your performance in some sport or activity and/or to change your physical appearance?**

O… Yes O… No

45. **How easy or difficult would it be for you to get…**

		Impossible	Very Difficult	Difficult	Easy	Very Easy	Don't know
a.	…cannabis (also known as "weed", "grass", "pot", hashish, "hash", hash oil) if you wanted some?	O	O	O	O	O	O
b.	…LSD or "acid" if you wanted some?	O	O	O	O	O	O
c.	…methamphetamines, or "speed" if you wanted some?	O	O	O	O	O	O
d.	…MDMA or "Ecstasy" if you wanted some?	O	O	O	O	O	O
e.	…cocaine if you wanted some?	O	O	O	O	O	O

Gambling:

46. **In the last 12 months, how often did you gamble or bet on the following things for money?**

		Not at all	Several times a year	Less than once a month	About once a month	About once a week	Daily or almost daily
a.	Bet on sporting events online	O	O	O	O	O	O
b.	Played cards for money	O	O	O	O	O	O
c.	Bet on sporting events with friend	O	O	O	O	O	O
d.	Played Video Lottery Terminals or coin slots	O	O	O	O	O	O
e.	Played bingo	O	O	O	O	O	O
f.	Played Sports Select Lottery	O	O	O	O	O	O
g.	Played any other lottery	O	O	O	O	O	O
h.	Played scratch tabs	O	O	O	O	O	O

47. **When (if ever) did you first gamble or bet on things for money or possessions?**

O… Grade 4 or before
O… Grade 5
O… Grade 6
O… Grade 7
O… Grade 8
O… Grade 9
O… Grade 10
O… Grade 11
O… Grade 12
O… Never gambled or bet in lifetime

48. **In the last 12 months, how often have you gone back another day to try to win back the money you have lost?**

O… Every time O… Some of the time
O… Most of the time O… Never

49.		Yes	No
a.	**In the last 12 months, when you were betting, have you ever told others you were winning money when you really weren't winning?**	O	O
b.	**In the last 12 months, have you ever gambled more than you had planned to?**	O	O
c.	**In the last 12 months, has anyone criticized your betting or told you that you had a gambling problem, regardless of whether you thought it was true or not?**	O	O
d.	**Has your betting in the last 12 months ever caused any problems for you such as arguments with family and friends, or problems at school or work?**	O	O
e.	**In the last 12 months, have you ever felt badly about the amount of money you bet or about what happens when you bet money?**	O	O
f.	**In the last 12 months, have you ever felt like you would like to stop betting money but didn't think you could?**	O	O
g.	**In the last 12 months, have you ever hidden any betting slips, I.O.U.'s, lottery tickets, money that you've won, or other signs of gambling from family and friends?**	O	O
h.	**In the last 12 months, have you had arguments with family or friends because of the money you spend on gambling?**	O	O
i.	**In the last 12 months, have you borrowed money to bet and not paid it back?**	O	O
j.	**In the last 12 months, have you borrowed money or stolen something in order to bet or to cover gambling debts?**	O	O
k.	**In the last 12 months, have you ever skipped or been absent from school or work due to betting activities?**	O	O

People You Know:

50. **Take a moment to think about the type of kid your age who smokes cigarettes…we're not thinking about anyone in particular, just your image of the type of person who smokes. How much do you think each word describes this person?**

		Not at all		Partly		Very Much
a.	Popular	①	②	③	④	⑤
b.	Smart	①	②	③	④	⑤
c.	Cool	①	②	③	④	⑤
d.	Good-looking	①	②	③	④	⑤
e.	Childish	①	②	③	④	⑤
f.	Dull	①	②	③	④	⑤

51. **Take a moment to think about the type of kid your age who frequently drinks alcohol…we're not thinking about anyone in particular, just your image of the type of person who frequently drinks alcohol. How much do you think each word describes this person?**

		Not at all		Partly		Very Much
a.	Popular	①	②	③	④	⑤
b.	Smart	①	②	③	④	⑤
c.	Cool	①	②	③	④	⑤
d.	Good-looking	①	②	③	④	⑤
e.	Childish	①	②	③	④	⑤
f.	Dull	①	②	③	④	⑤

52. **Take a moment to think about the type of kid your age who uses drugs…we're not thinking about anyone in particular, just your image of the type of person who uses drugs.**
How much do you think each word describes this person?

		Not at all		Partly		Very Much
a.	Popular	①	②	③	④	⑤
b.	Smart	①	②	③	④	⑤
c.	Cool	①	②	③	④	⑤
d.	Good-looking	①	②	③	④	⑤
e.	Childish	①	②	③	④	⑤
f.	Dull	①	②	③	④	⑤

53. Suppose you were with a group of friends and there were some cigarettes there that you could have if you wanted. **How willing would you be to…**

		Not at all	Kind of	Very willing
a.	Take some and use it	①	②	③

54. Suppose you were with a group of friends and there was some alcohol there that you could have if you wanted. **How willing would you be to…**

		Not at all	Kind of	Very willing
a.	Take some and use it	①	②	③
b.	Use enough to get drunk	①	②	③

55. Suppose you were with a group of friends and there were some drugs there that you could have if you wanted. **How willing would you be to…**

		Not at all	Kind of	Very willing
a.	Take some and use it	①	②	③
b.	Use enough to get high	①	②	③

56.a	How likely is it you will smoke cigarettes in the next year?	I definitely will not ①	I probably will not ②	I probably will ③	I definitely will ④
56.b	Do you plan to smoke cigarettes in the next year?	I do not plan to ①	Probably won't ②	Probably will ③	I plan to ④
56.c	How likely is it you will drink alcohol in the next year?	I definitely will not ①	I probably will not ②	I probably will ③	I definitely will ④
56.d	Do you plan to drink alcohol in the next year?	I do not plan to ①	Probably won't ②	Probably will ③	I plan to ④
56.e	How likely is it you use drugs in the next year?	I definitely will not ①	I probably will not ②	I probably will ③	I definitely will ④
56.f	Do you plan to use drugs in the next year?	I do not plan to ①	Probably won't ②	Probably will ③	I plan to ④

In the next part, we would like you to think about your mother, your father, and your two closest friends. Please answer the following questions for each person listed.

57.	Your mother (or step mother, or female guardian)	Your father (or step father, or male guardian)	Your closest friend #1	Your closest friend #2

57.		Your mother (or step mother, or female guardian)	Your father (or step father, or male guardian)	Your best friend #1	Your best friend #2
i.	**Does this person use illegal drugs?**	O… Yes O… No	O… Yes O… No	O… Yes O… No	O… Yes O… No
j.	**How easy would it be for you to get illegal drugs from this person, if you wanted to?**	① Not at all easy ② ③ ④ ⑤ Very easy	① Not at all easy ② ③ ④ ⑤ Very easy	① Not at all easy ② ③ ④ ⑤ Very easy	① Not at all easy ② ③ ④ ⑤ Very easy
k.	**In the past 12 months, how much pressure have you felt from this person to use illegal drugs?**	① No pressure at all ② ③ ④ ⑤ A lot of pressure	① No pressure at all ② ③ ④ ⑤ A lot of pressure	① No pressure at all ② ③ ④ ⑤ A lot of pressure	① No pressure at all ② ③ ④ ⑤ A lot of pressure
l.	**In the past 12 months how much pressure have you felt from this person to avoid using illegal drugs?**	① No pressure at all ② ③ ④ ⑤ A lot of pressure	① No pressure at all ② ③ ④ ⑤ A lot of pressure	① No pressure at all ② ③ ④ ⑤ A lot of pressure	① No pressure at all ② ③ ④ ⑤ A lot of pressure

For question 58 please print you answer in the boxes provided and fill in the circles below the boxes. For numbers less than 100 please put a 0 in the first box. For numbers less than 10 please print 0's in the first two boxes.

58.	In the past 12 months, what percentage of students in your grade has used:							
a.	**Tobacco?**	b.	**Alcohol?**	c.	**Cannabis or Marijuana?**	d.	**Crystal Meth?**	

For question 59, think about someone your age and sex…

59.a. **How often do you think that they drink alcohol?**

- O Never
- O Monthly or less
- O 2 to 4 times per month
- O 2 to 3 times per week
- O 4 or more times per week

59.b. **How often do you think that they drink 5 or more drinks on one occasion?**

- O Never
- O Less than monthly
- O Monthly
- O Weekly
- O Daily or almost daily

59.c. **How many drinks do you think they have on a typical day when they are drinking?**

- O 1 to 2 drinks
- O 3 to 4 drinks
- O 5 to 6 drinks
- O 7 to 9 drinks
- O 10 or more drinks

60. **Please answer the following questions by shading one bubble for each statement.**

		Never	Rarely	Sometimes	Most of the time	Always
a.	My parents know where I am after school.	O	O	O	O	O
b.	When I go out at night, my parents know who I am with.	O	O	O	O	O
c.	When I go out at night, my parents know where I am.	O	O	O	O	O
d.	When I go out on weekend nights, I have to be home by a set time.	O	O	O	O	O

Different people's mothers and fathers are different, and we want to know about yours.

For each of the next questions, each number is followed by four different types of parents. Read the four statements and decide which one BEST describes your parent.

Now please think about **YOUR MOTHER**.

If you do not ever spend time with your mother, but another woman lives in your house instead, please respond about that woman.

61.a **Which of these is most like your mother?**

- O… Some mothers **never have enough time** to talk to their children.
- O… Some mothers **usually don't have enough time** to talk to their children.
- O… Some mothers **sometimes have enough time** to talk to their children.
- O… Some mothers **always have enough time** to talk to their children.

61.b **Which of these is most like your mother?**

- O… Some mothers **always explain** to their children about they way they should behave.
- O… Some mothers **sometimes explain** to their children about the way they should behave.
- O… Some mothers **sometimes make** their children behave because they're the boss.
- O… Some mothers **always make** their children behave because they're the boss.

61.c **Which of these is most like your mother?**

- O… Some mothers **always ask** their children what they did in school that day.
- O… Some mothers **usually ask** their children what they did in school that day.
- O… Some mothers **usually don't ask** their children what they did in school that day.
- O… Some mothers **never ask** their children what they did in school that day.

61.d **Which of these is most like your mother?**

- O… Some mothers **always get very upset** if their children don't do what they're supposed to right away.
- O… Some mothers **sometimes get very upset** if their children don't do what they're supposed to right away.
- O… Some mothers **sometimes try to understand** why their children don't do what they're supposed to right away.
- O… Some mothers **always try to understand** why their children don't do what they're supposed to right away.

61.e **Which of these is most like your mother?**

- O… Some mothers **always have the time to talk** about their children's problem.
- O… Some mothers **sometimes have the time to talk** about their children's problem.
- O… Some mothers **don't always have the time to talk** about their children's problem.
- O… Some mothers **never have the time to talk** about their children's problem.

61.f **Which of these is most like your mother?**

- O… Some mothers **never punish** their children; they **always talk** to their children about what is wrong.
- O… Some mothers **hardly ever punish** their children; they **usually talk** to their children about what is wrong.
- O… Some mothers **usually punish** their children when they've done something wrong **without talking to them very much**.
- O… Some mothers **always punish** their children when they've done something wrong **without talking to them at all**.

61.g **Which of these is most like your mother?**

- O… Some mothers **always tell** their children what to do.
- O… Some mothers **sometimes tell** their children what to do.
- O… Some mothers **sometimes** like their children to **decide for themselves what to do**.
- O… Some mothers **always** like their children to **decide for themselves what to do**.

61.h **Which of these is most like your mother?**

- O… Some mothers **always think it is OK** if their children make mistakes.
- O… Some mothers **sometimes think it is OK** if their children make mistakes.
- O… Some mothers **always get angry** if their children make mistakes.
- O… Some mothers **sometimes get angry** if their children make mistakes.

61.i **Which of these is most like your mother?**

- O… Some mothers **never want to know** what their children are doing.
- O… Some mothers **usually don't want to know** what their children are doing.
- O… Some mothers **sometimes want to know** what their children are doing.
- O… Some mothers **always want to know** what their children are doing.

61.j **Which of these is most like your mother?**

- O… Some mothers **always get upset** when their children don't do well in school.
- O… Some mothers **sometimes get upset** when their children don't do well in school.
- O… Some mothers **hardly ever get upset** when their children don't do well in school.
- O… Some mothers **never get upset** when their children don't do well in school.

61.k **Which of these is most like your mother?**

- O… Some mothers **always like to talk to their children's teachers** about how they are doing in school.
- O… Some mothers **sometimes like to talk to their children's teachers** about how they are doing in school.
- O… Some mothers **usually don't like to talk to their children's teachers** about how they are doing in school.

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Now please think about **YOUR FATHER.**

If you do not ever spend time with your father, but another man lives in your house instead, please respond about that man.

62.a **Which of these is most like your father?**

- O… Some fathers **never have enough time** to talk to their children.
- O… Some fathers **usually don't have enough time** to talk to their children.
- O… Some fathers **sometimes have enough time** to talk to their children.
- O… Some fathers **always have enough time** to talk to their children.

62.b **Which of these is most like your father?**

- O… Some fathers **always explain** to their children about they way they should behave.
- O… Some fathers **sometimes explain** to their children about the way they should behave.
- O… Some fathers **sometimes make** their children behave because they're the boss.
- O… Some fathers **always make** their children behave because they're the boss.

62.c **Which of these is most like your father?**

- O… Some fathers **always ask** their children what they did in school that day.
- O… Some fathers **usually ask** their children what they did in school that day.
- O… Some fathers **usually don't ask** their children what they did in school that day.
- O… Some fathers **never ask** their children what they did in school that day.

62.d **Which of these is most like your father?**

- O… Some fathers **always get very upset** if their children don't do what they're supposed to right away.
- O… Some fathers **sometimes get very upset** if their children don't do what they're supposed to right away.
- O… Some fathers **sometimes try to understand** why their children don't do what they're supposed to right away.
- O… Some fathers **always try to understand** why their children don't do what they're supposed to right away.

62.e **Which of these is most like your father?**

- O… Some fathers **always have the time to talk** about their children's problem.
- O… Some fathers **sometimes have the time to talk** about their children's problem.
- O… Some fathers **don't always have the time to talk** about their children's problem.
- O… Some fathers **never have the time to talk** about their children's problem.

62.f **Which of these is most like your father?**

- O… Some fathers **never punish** their children; they **always talk** to their children about what is wrong.
- O… Some fathers **hardly ever punish** their children; they **usually talk** to their children about what is wrong.
- O… Some fathers **usually punish** their children when they've done something wrong **without talking to them very much**.
- O… Some fathers **always punish** their children when they've done something wrong **without talking to them at all**.

62.g **Which of these is most like your father?**

- O… Some fathers **always tell** their children what to do.
- O… Some fathers **sometimes tell** their children what to do.
- O… Some fathers **sometimes** like their children to **decide for themselves what to do**.
- O… Some fathers **always** like their children to **decide for themselves what to do**.

62.h **Which of these is most like your father?**

- O… Some fathers **always think it is OK** if their children make mistakes.
- O… Some fathers **sometimes think it is OK** if their children make mistakes.
- O… Some fathers **always get angry** if their children make mistakes.
- O… Some fathers **sometimes get angry** if their children make mistakes.

62.i **Which of these is most like your father?**

- O… Some fathers **never want to know** what their children are doing.
- O… Some fathers **usually don't want to know** what their children are doing.
- O… Some fathers **sometimes want to know** what their children are doing.
- O… Some fathers **always want to know** what their children are doing.

62.j **Which of these is most like your father?**

- O… Some fathers **always get upset** when their children don't do well in school.
- O… Some fathers **sometimes get upset** when their children don't do well in school.
- O… Some fathers **hardly ever get upset** when their children don't do well in school.
- O… Some fathers **never get upset** when their children don't do well in school.

62.k **Which of these is most like your father?**

- O… Some fathers **always like to talk to their children's teachers** about how they are doing in school.
- O… Some fathers **sometimes like to talk to their children's teachers** about how they are doing in school.
- O… Some fathers **usually don't like to talk to their children's teachers** about how they are doing in school.
- O… Some fathers **never like to talk to their children's teachers** about how they are doing in school.

What do you think?

On these pages you will find a series of vignettes. Each one describes an incident and lists three ways of responding to it. Please read each vignette and then consider the responses in turn. Think of each response option in terms of how likely it is that you would respond in that way.

We all respond in a variety of ways to situations, and probably each response is at least slightly likely for you. Please rate how likely you would respond in that way. The higher the number you pick the more likely that you would do this.

Very unlikely			Moderately Likely			Very likely
①	②	③	④	⑤	⑥	⑦

Please select one number for each of the three responses on the answer sheet for each vignette.

63. **You have just received the results of a test you took, and you discovered that you did very poorly. Your initial reaction is likely to be:**

		Very unlikely		Moderately likely				Very likely
a.	"I can't do anything right," and feel sad.	①	②	③	④	⑤	⑥	⑦
b.	"I wonder how it is I did so poorly," and feel disappointed.	①	②	③	④	⑤	⑥	⑦
c.	"That stupid test doesn't show anything," and feel angry.	①	②	③	④	⑤	⑥	⑦

64. **When you and your friend are making plans for Saturday evening, it is likely that you would:**

		Very unlikely		Moderately likely				Very likely
a.	Leave it up to your friend; he (she) probably wouldn't want to do what you'd suggest.	①	②	③	④	⑤	⑥	⑦
b.	Each make suggestions and then decide together on something that you both feel like doing.	①	②	③	④	⑤	⑥	⑦
c.	Talk your friend into doing what you want to do.	①	②	③	④	⑤	⑥	⑦

65. **You have been invited to a large party where you know very few people. As you look forward to the evening, you would likely expect that:**

		Very unlikely			Moderately likely			Very likely
a.	You'll try to fit in with whatever is happening in order to have a good time and not look bad.	①	②	③	④	⑤	⑥	⑦
b.	You'll find some people with whom you can relate.	①	②	③	④	⑤	⑥	⑦
c.	You'll probably feel somewhat isolated and unnoticed.	①	②	③	④	⑤	⑥	⑦

66. **Within your circle of friends, the one with whom you choose to spend the most time is:**

		Very unlikely			Moderately likely			Very likely
a.	The one with whom you spend the most time exchanging ideas and feelings.	①	②	③	④	⑤	⑥	⑦
b.	The one who is the most popular of them.	①	②	③	④	⑤	⑥	⑦
c.	The one who needs you the most as a friend.	①	②	③	④	⑤	⑥	⑦

67. **Your friend has a habit that annoys you to the point of making you angry. It is likely that you would:**

		Very unlikely			Moderately likely			Very likely
a.	Point it out each time you notice it, that way maybe he(she) will stop doing it.	①	②	③	④	⑤	⑥	⑦
b.	Try to ignore the habit because talking about it won't do any good anyway.	①	②	③	④	⑤	⑥	⑦
c.	Try to understand why your friend does it and why it is so upsetting for you.	①	②	③	④	⑤	⑥	⑦

68. **A close (same-sex) friend of yours has been moody lately, and a couple of times has become very angry with you over "nothing." You might:**

		Very unlikely			Moderately likely			Very likely
a.	Share your observations with him/her and try to find out what is going on for him/her.	①	②	③	④	⑤	⑥	⑦
b.	Ignore it because there's not much you can do about it anyway.	①	②	③	④	⑤	⑥	⑦
c.	Tell him/her that you're willing to spend time together if and only if he/she makes more effort to control him/herself.	①	②	③	④	⑤	⑥	⑦

69. **You feel that your friend is being inconsiderate. You would probably:**

		Very unlikely			Moderately likely			Very likely
a.	Find an opportunity to explain why it bothers you; he (she) may not even realize how much it is bothering you.	①	②	③	④	⑤	⑥	⑦
b.	Say nothing; if your friend really cares about you he (she) would understand how you feel.	①	②	③	④	⑤	⑥	⑦
c.	Demand that your friend start being more considerate; otherwise you'll respond in kind.	①	②	③	④	⑤	⑥	⑦

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70. **How much do you agree or disagree with each of the following statements?**

Strongly Agree	Moderately agree	Agree	Disagree	Moderately disagree	Strongly disagree
①	②	③	④	⑤	⑥

a.	I haven't really considered politics. They just don't excite me much.	①	②	③	④	⑤	⑥
b.	I might have thought about a lot of different things but there has never really been a decision since my parent said what they wanted.	①	②	③	④	⑤	⑥
c.	When it comes to religion, I just haven't found any that I'm into myself.	①	②	③	④	⑤	⑥
d.	My parents had it decided a long time ago what I should go into and I'm following their plans.	①	②	③	④	⑤	⑥
e.	There are so many different political parties and ideals. I can't decide which to follow until I figure it all out.	①	②	③	④	⑤	⑥
f.	I don't give religion much thought and it doesn't bother me one way or the other.	①	②	③	④	⑤	⑥
g.	I guess I'm pretty much like my folks when it comes to politics. I follow what they do in terms of voting and such.	①	②	③	④	⑤	⑥
h.	I haven't chosen the occupation I really want to get into, but I'm working toward becoming a ___ until something better comes along.	①	②	③	④	⑤	⑥
i.	A person's faith is unique to each individual. I've considered and reconsidered it myself and know what I can believe.	①	②	③	④	⑤	⑥
j.	It took me a long time to decide but now I'm sure what direction to move in for a career.	①	②	③	④	⑤	⑥
k.	I really never was involved in politics enough to have to make a firm stand one way or the other.	①	②	③	④	⑤	⑥
l.	I'm not so sure what religion means to me. I'd like to make up my mind but I am not done looking yet.	①	②	③	④	⑤	⑥
m.	I thought my political beliefs through and realize I may or may not agree with many of my parents' beliefs.	①	②	③	④	⑤	⑥
n.	It took me a while to figure it out, but now I really know what I want for a career.	①	②	③	④	⑤	⑥
o.	Religion is confusing to me right now. I keep changing my views on what is right and wrong to me.	①	②	③	④	⑤	⑥
p.	I'm sure it will be pretty easy for me to change my occupational goals when something better comes along.	①	②	③	④	⑤	⑥
q.	My folks have always had their own political and moral beliefs about issues like abortion and mercy killing and I've always gone along accepting what they have.	①	②	③	④	⑤	⑥
r.	I've gone through a period of serious questioning about faith and can now say I understand what I believe in as an individual.	①	②	③	④	⑤	⑥
s.	I'm not sure about my political beliefs, but I'm trying to figure out what I can truly believe in.	①	②	③	④	⑤	⑥
t.	I just can't decide how capable I am as a person and what jobs I'll be right for.	①	②	③	④	⑤	⑥
u.	I attend the same church as my family has always attended. I've never really questioned why.	①	②	③	④	⑤	⑥
v.	I just can't decide what to do for an occupation. There are so many possibilities.	①	②	③	④	⑤	⑥
w.	I've never really questioned my religion. If it's right for my parents, it must be right for me.	①	②	③	④	⑤	⑥
x.	Politics are something that I can never be too sure about because things change so fast. But I do think it's important to know what I believe in.	①	②	③	④	⑤	⑥

Thanks for taking part in the survey!!