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PERCEPTIONS OF INVULNERABILITY AND
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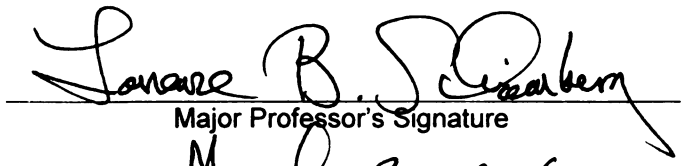

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PERCEPTIONS OF INVULNERABILITY AND ADOLESCENT SEXUAL ACTIVITY

By

Sherry M. Knoppers

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Family and Child Ecology

2006

ABSTRACT

PERCEPTIONS OF INVULNERABILITY AND

ADOLESCENT SEXUAL ACTIVITY

By

Sherry M. Knoppers

Every year three million teens contract a sexually transmitted disease (Alan Guttmacher Institute, 1994) and close to one million teens become pregnant (The National Campaign to Prevent Teen Pregnancy, 2001). Youth who choose to abstain from sexual activity eliminate the risk of contracting a sexually transmitted disease while avoiding pregnancy and possible emotional consequences. Yet, even with successful intervention programs, not all youth enjoy the desired outcome. Human ecology provides a framework to help better understand the multiple influences impacting adolescents. The adolescent personal fable, first described by Elkind (1979), is a concept that may also help explain why some youth choose to engage in risky behavior even when aware of the potential consequences. Are adolescents with higher levels of invulnerability more likely to engage in sexual activity? The design of this study was a cross-sectional survey, the purpose of which was to examine the relationship between perceived invulnerability to pregnancy and STD's and sexual activity. Using an adaptation of the Dane County Youth Assessment (University of Wisconsin Board of Regents, 1999) measures, combined with vulnerability questions from The New Personal Fable Scale (Lapsley, FitzGerald, Rice, & Jackson, 1989) and questions developed by the researcher, 67 usable surveys were completed by youth taking Life Skills classes in a mid sized Midwestern city and the surrounding

area. A Spearman *Rho* was used to look at the correlation between perceived invulnerability and sexual activity and logistic regression was used to look at the relationship between perceived invulnerability and other predictors of sexual activity. While no relationship was found between feelings of invulnerability and sexual activity even when controlling for other predictors of sexual activity, perceived invulnerability did have some impact on the sexual behavior of youth with multiple risk factors and fewer protective factors. The latter result offers some support for the notion that perceived invulnerability may impact adolescent sexual activity, especially in high-risk youth. Interventions to decrease feelings of invulnerability and overall risk may be helpful in decreasing adolescent sexual activity.

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ACKNOWLEDGEMENTS

I would like to extend my sincere appreciation to those individuals who have contributed to the success of this research project. My deepest appreciation to Lawrence Schiamberg, my chairperson, for his guidance, support, encouragement and patience. I would also like to thank Thomas Luster, Robert Griffore, and John Eulenberg, committee members, for their input, suggestions, and support. I am also thankful for the time and energy the supervisor and group facilitators at Wedgwood put into helping me obtain the needed surveys.

I want to extend a special note of appreciation to my husband John and sons, Landon and Logan. Their patience and support through this long process was commendable! Above all I hope that this work will bring honor and glory to God and that its impact will be pleasing to Him.

TABLE OF CONTENTS

LIST OF TABLES

Chapter 1

Introduction and Statement of the Problem

Introduction

Adolescent sexual activity is a topic of interest and concern to society. *Healthy People 2010 Ten Leading Health Indicators for the Nation* and the Surgeon General's public health priorities both include promoting responsible sexual behavior (Satcher, 2001). Every year three million teens contract a sexually transmitted disease (Alan Guttmacher Institute, 1994). Nearly 1 in 4 sexually active young people will get a sexually transmitted disease or infection (STD) (Kaiser Family Foundation, 2003). The Office of the Surgeon General (2001) reported that rates for gonorrhea are greatest among 15-19 year olds and females in this age group have the highest rates of Chlamydia. In addition, close to one million teens become pregnant each year accounting for about $1/5^{th}$ of all sexually active females (Kalmuss, Davidson, Cohall, Laraque, & Cassell, 2003; The National Campaign to Prevent Teen Pregnancy, 2001). Nearly half of all unintended pregnancies occur in adolescents (Office of the Surgeon General, 2001). These adolescent pregnancies place a large burden on society both in medical and social costs and as these children grow up, they are at a very high risk for engaging in early sexual activity themselves (Levine, Pollack, & Comfort, 2001).

Rector, Johnson, and Noyes (2003) report that the majority of sexually active teens wish they had waited longer before beginning sexual activity and that teens who are sexually active are significantly less likely to be happy. They are also more likely to feel depressed and attempt suicide than teens that are not sexually active (Rector et al., 2003). Topolski et al. (2001) looked at quality of life indicators and found that

youth who abstain from high risk sexual behaviors report a higher quality of life than those who experiment or engage regularly in these behaviors.

Youth who choose to abstain from sexual activity can eliminate the risk of contracting sexually transmitted diseases while avoiding pregnancy and possible emotional consequences. The Physicians Consortium holds that it is best for adolescents to wait until marriage for sexual involvement as an arbitrary delay to just a "later age" still leaves youth at risk for STD infection (Diggs, Wallis, Mohn, & Jones, 2001). Youth who become sexually active at an earlier age usually end up having more sexual partners, which is linked to greater STD risk. Condom use generally decreases over time, so youth who become sexually active at an earlier age are likely to have a greater number of sexual acts unprotected against STDs and teen pregnancy than teens that begin sex at a later age (Diggs et al., 2001). In a study of rural youth, Yarber, Milhausen, Crosby, and DiClemente (2002) had similar findings and surmised that rural youth who initiate sexual activity at an early age are at an increased risk of engaging in subsequent sexual risk behaviors, such as having multiple sex partners and not using a condom.

If adolescents wait until they are in stable marriage relationships before becoming sexually active and remain faithful in these relationships, many societal problems could be eliminated. Single parenting would be limited to those losing their partner to divorce, still a societal concern, or death. Those who continue to remain faithful in the marriage relationship would have no fear of STD's. Even HIV infection would decrease drastically, being spread only by those using contaminated drug needles or by rare accidental exposure such as with medical personal.

With this in mind, few would disagree that sexual abstinence is best for adolescents, yet the high percentage of sexually active teens indicates that many youth are not abstaining from sex. In 1999 almost 50% of high school students had engaged in sexual intercourse at least once with around 16% of these youth having been with four or more sexual partners (Kann et al., 2000). By their senior year of high school, nearly two-thirds of adolescents reported that they had engaged in sex (Kaiser Family Foundation, 2003).

While promoting abstinence is a laudable goal it is unclear how it can best be accomplished. It is even more challenging when a clear definition of sexual activity and sexual abstinence is lacking (Bailey, Young, Knickerbocker, & Doan, 2002). Hawkins et al. (2002) examined adolescent perceptions of the terms abstinence and sexual activity. While perceptions of abstinence were related to age, other factors such as gender, virginity status, attendance at religious services, and perceived religiosity did not impact perception. Haglund (2003) found most sexually abstinent African American females in this study referred to "having sex" as vaginal intercourse and being abstinent as refraining from intercourse. Knoppers (2003b) defines sexual abstinence as "not engaging in sexual activity that could put a youth at risk of contracting a sexually transmitted disease or cause pregnancy." This definition focuses on the negative societal implication to sexual activity, framing it broadly enough to cover potential consequences. It can also be viewed on a continuum ranging from any type of physical contact at one end of the scale to doing any type of sexual activity except actual vaginal intercourse at the other end (Knoppers, 2003b). If youth view sexual activity at this later end of the continuum it could put them at

risk for the consequences of sexual activity if they do "everything but", thinking this is still abstinence (Haglund, 2003).

Many approaches to promoting sexual abstinence in teens have been tried with varying results. The majority of programs provide youth with information about the risks involved with sexual activity. If adolescents have this information why then do so many still engage in sexual activity? What other factors impact their behavior? Could feelings of invulnerable to the potential consequences play a part?

Anderson, Nyamathi, McAvoy, Conde, and Casey (2001) found that adolescents in juvenile detention facilities did not see themselves as being at risk for HIV infection even when sexually active. Because they associated HIV with drug use and did not know many infected people, they were more worried about gangs, drugs, and violence in their neighborhoods and did not see sexual activity as a concern. Even with risk factors present, few girls in another study perceived themselves to be at risk for HIV (Morrison-Beedy, Carey, & Aronowitz, 2003). Williams, Norris, and Bedor (2003) had similar findings in a study of college students. Less than half of them used condoms at last intercourse with no correlation to the type of partner they had, and they did not express any fear of HIV or other STDs. Worse yet, DiClemente et al. (2002) found that teens who had had sexually transmitted diseases were more knowledgeable about STD prevention but were more likely to engage in unprotected sex.

Chapin (2001) found that a group of high-risk African American adolescents felt that they were less likely than their peers to become pregnant (or cause a pregnancy). These youth displayed an optimistic bias, underestimating their personal

risk in relation to their peers. High school students with high feelings of perceived invulnerability also perceived themselves as less susceptible to sexual risks. They may well believe that if they had engaged in risky sexual behavior without any negative consequences, they are immune (Chapin, 2001).

Another study found no relationship between frequency of participants' risk-reducing behaviors and their perceived probability of HIV infection (Cohen & Bruce, 1997) while Hutchinson (1999) did find a correlation in youth who were consistent in using condoms, satisfied with their relationships, and perceived their partner as uninfected. These young women had increased odds of believing they were at no risk for sexually transmitted diseases or infections including HIV, likely related in part to their perceived lack of risk and their risk reducing behavior. Apparently feeling good about their relationships and believing that their partners did not have any STDs along with taking the precaution of using condoms gave them a feeling of safety or invulnerability.

Porter, Oakley, Guthrie, and Killion (1999) did not find initiation of sexual intercourse correlated to any shifts in perceived costs or benefits but to increases in the frequency of the intimate behaviors of going out together alone, kissing and making out, and the opportunity for intercourse when home alone. So these youth looked less at perceived costs and benefits and more at behaviors leading to sexual intimacy and the opportunity to progress to that level.

Adolescents can perceive benefits and costs associated with unprotected sex, though. Parsons, Perry, Bimbi, and Borkowski (2000) found that college students' sexual risk behaviors were correlated to their perceptions of the benefits associated

with unprotected sex. They seemed to perceive the positive outcomes associated with unprotected sex as greater than the costs or potential negative outcomes, in their minds justifying their sexual risk-taking behaviors. In this study perceptions of the positive outcomes of unprotected sex, along with the inability to resist temptation and low self-efficacy for safer sex, were predictive of sexual risk-taking for these youth (Parsons et al., 2000). In an earlier study Parsons, Siegel, and Cousins (1997) also found that risk perception seemed less important than perceived benefits to the risks involved with sexual risk taking. If youth's perception of benefits better predicts risk-taking behavior than perceived costs, addressing this area of adolescent prevention may be important in decreasing sexual risk taking among adolescents.

Yet this aspect of adolescent sexuality needs further study. Numerous studies have shown that many different variables correlated to adolescent sexual activity, but what is the impact of feelings of invulnerability? Do adolescents' perception of invulnerability to the potential negative consequences of sexual activity impact their intentions or behavior? While this piece alone warrants consideration, many other factors also impact sexual behavior. What is the relationship between feelings of invulnerability and other risk factors for adolescent sexual behavior?

Purpose

The purpose of this study is to answer these questions: Is there a relationship between youths' perceived invulnerability to pregnancy and STDs and sexual activity? And, what is the relationship between youths' perceived invulnerability to pregnancy and STDs and sexual activity when considering other predictors of sexual activity (e.g. drug use, peer group, parental support)? This study also looked to

answer questions about how the individual risk and protective factors for adolescent sexual activity as well as factors at the microsystem and macrosystem levels relate to feelings of invulnerability.

Chapter 2

Review of Research

Human ecology provides a framework to help better understand the multiple influences impacting adolescents. Viewed from a human ecological perspective, how an adolescent develops is a function of the individual person and environment over the period of time that person is developing (Bronfenbrenner, 1989). The ecological model is a dynamic interactive model where the individual adapts to the environment, and the environment positively or adversely impacts development (Blum, McNeely, & Nonnemaker, 2001). Bronfenbrenner (1989) sees humans inextricably embedded in their environment. Both individual factors and environmental factors may contribute to an adolescent's decision to be sexually active or to abstain from sexual activity. The base of behavior and development lies in the dynamic relationships within the individual-context system. The relative plasticity of developmental systems can help in planning interventions to prevent negative developmental trajectories, and can also provide ideas on how to promote system changes that can optimize positive healthy functioning (Lerner, 2003).

An Ecological Perspective to Youth Sexual Activity

Perkins, Luster, Villarruel, and Small (1998) found that factors at the individual, family, and extra-familial level were all predictive of sexual activity in adolescents from different ethnic groups, though there were a few gender differences. Talashek, Norr, and Dancy (2003) also discuss individual, family, and environmental factors impacting adolescent sexual risk taking.

Individual level.

On an individual level, youth with frequent attendance at religious services, who are more actively involved in religious activities or attached to religious institutions, have strong religious beliefs, or those who make virginity pledges are much less likely to be sexually active (Brewster, Cooksey, Guilkey, & Rindfuss, 1998; Diggs et al., 2001; Kalmuss et al., 2003; Kirby, 2001b; Lammers, Ireland, Resnick, & Blum, 2000; Satcher, 2001; and Scales & Leffert, 1999). While religious beliefs are very individual, the adolescent's environment may have an influence as well.

Also looking at the individual, Paradise, Cote, Minsky, Lourenco, and Howland (2001) found that in their study of adolescent girls' reasons for having or not having sex, values and beliefs were cited by the majority of virgins. Most of these girls felt that the time was not right for them, they wanted to wait until they were older, or they wanted to wait until they were married. Self-efficacy can also impact an adolescent's decision to remain sexually abstinent (Taris, & Semin, 1999). Kirby (2001b) found that adolescents' emotional well being, their own sexual beliefs and norms about sexual behaviors, their attitudes, their skills, and their motivation also can affect sexual behaviors.

Halpern, Joyner, Udry, and Suchindran (2000) found that higher intelligence was associated with postponement of the initiation of the full spectrum of sexual activities. They concluded that higher intelligence in the individual is a protective factor against early sexual activity during adolescence even when controlling for age, physical maturity, and mother's education.

The time between puberty and psychosocial maturity has grown larger with puberty being reached at an earlier age today than it was in the past (Baumrind, 1987) and many young adults getting married later. Youth who reach puberty earlier than their peers are at increased risk (Bearman & Bruckner, 2001). Doswell and Braxter (2002) also note this increased risk for early sexual behavior with early pubertal development. Hormone levels can make a difference as well (Kirby, 2001b). Halpern, Udry, and Suchindran (1997) found that testosterone and changes in testosterone were significantly related to the timing of sexual initiation. While this physiological aspect of the individual did impact timing of first sex, the frequency of attendance at religious services acted as a social control variable for subjects. The effect of testosterone was negated for those youth who attended religious services more frequently (Halpern et al., 1997).

Green, Kromar, and Walters (2000) looked at sensation seeking as an individual variable associated with high risk behaviors including risky sexual behaviors. They also noted that this factor peaks during the adolescent years, especially in males. This coincides with the rise in testosterone, which may contribute to sensation seeking. They also acknowledged, though, that problem behaviors such as sexual risk taking are related to family socialization and communication patterns as well (Green, Kromar, & Walters, 2000). Owens and Shaw (2003) see individual characteristics as among the most influential of the environmental factors.

Another relevant individual factor is the adolescent's cognitive interpretation or perception of risk related to sexual activity. Feelings of invulnerability, in particular, may impact adolescent sexual behavior. This concept, under the heading of

adolescent personal fable, will be discussed further starting on page 32 while the narrower aspect of feelings of invulnerability will be more carefully addressed after the discussion of risk and protective factors beginning on page 35.

Contexts of youth sexual behavior.

Environmental impacts on individuals and their interactions with the environment occur at several different levels. Bronfenbrenner (1989) categorized the microsystem as a place where face-to-face interactions occur, the mesosystem as the links between microsystems, exosystems as similar to mesosytems but with at least one of the microsystems not containing the developing person, and the macrosystem as consisting of the overarching belief system of a given culture or social context.

At the microsystem level of the family, parental involvement including close, warm parent-child relationships and amount of supervision or monitoring, has been shown to influence adolescent sexual activity (Blum & Rinehart, 1997; Satcher, 2001; The National Campaign to Prevent Teen Pregnancy, 2001; Wu et al., 2003) especially if the parents are good communicators (Karofsky, Zeng, & Kosorok, 2001; Miller, Norton, Fan, & Christopherson, 1998). Blake, Simkin, Ledsky, Perkins, and Calabrese (2001) even found that adding homework assignments that require parental interaction to existing abstinence-only curriculum, in essence promoting parental involvement, resulted in greater self-efficacy for refusing high-risk behaviors. The effect of parental involvement may even go back to infancy. Werner and Smith (2001) found that having had less anxious, insecure relationships with their caregivers as infants and a stronger feeling of security as part of their families in adolescence led to better outcomes for youth who had been teenage mothers but managed to do well

later in life. So while these factors did not prevent the adolescents from engaging in sexual activity and the resulting pregnancy, they did correlate with better long term outcomes for them. Owens and Shaw (2003) see these characteristics of the parent and family environments as having a great impact.

In this microsystem youth also care about what their parents think, or at least, what they think their parents think. One study found that the more disapproving adolescents perceived their mothers to be toward their engaging in sexual intercourse and the more satisfied they were with their relationship with their mothers, the less likely they were to initiate sexual activity (Dittus & Jaccard, 2000). Kalmuss et al. (2003) also found those who thought their mothers disapproved of their having sex were less likely than others to engage in sexual activity. When parents communicate stricter values to their teens about having sex or about premarital sex in general, the youth are then more likely to wait longer before engaging in sex. So, family values about sexual behavior can have an impact on the adolescents' behavior (Kirby, 2001b). Miller (2002) agreed with this in finding that parental supervision along with parents' values against teen intercourse did impact adolescent risk taking.

Basic demographic aspects of the family microsystem can also make a difference. For example, the presence of the father in the child's household at ages 11-12 decreased the odds of initiating sex in early adolescence in a sample of adolescents whose mothers had given birth to them as teens (Cooksey, Mott, & Neubauer, 2002). Lammers, Ireland, Resnick, and Blum (2000) found youth in dual-parent families showed lower levels of sexual activity and delayed onset of sexual activity as well. Miller (2002) also found that family structure (mainly having two

parents in the home, not just one) had an impact, as did Kirby (2001b) who also found levels of education and income correlated. Looking at factors associated with the increase in the teen birthrate in the 1980's, negative changes in family environments (such as increases in family disruption) are believed to have contributed to this while recent declines in teen birthrates may be attributed to positive changes in family environments such as improvements in maternal education (Manlove, Terry, Gitelson, Romano, & Russell, 2000).

Still looking at the parental aspect of the family microsystem, authoritative parenting, which is not overly strict or authoritarian, helps guide children's activities with consistency and requires them to contribute to the family. Authoritative parents are not afraid to confront their children so that they understand the family values and respect these norms. Children with authoritative parents are loved, supported, stimulated, and challenged. These parents balance the ratio of children's autonomy to parental control so that young children have stricter controls and adolescents are allowed more autonomy (Baumrind, 1987). The family microsystem needs to balance expressions of individuality with those of connectedness. If this microsystem leads to emotional distance from the family it may result in youth who are more susceptible to peer influences. Strong attachments between parents and youth that continue through adolescence along with consistent management policies in traditional families help shield youth from dysfunctional risk-taking behavior (Baumrind, 1987). Along these lines, adolescents who are provided with rational explanations for parental decisions are more likely to use their parents as role models and to choose friends that their parents would consider appropriate (Baumrind, 1987). Hetherington and Elmore

(2003) found that girls with divorced parents were more likely to live in a single-parent home with non-authoritative parenting and often a sexually active mother. This combination of risk factors was associated with earlier and more promiscuous sexual activities and teenage pregnancy. Conversely having a close relationship with an authoritative parent promoted well-being for children from divorced homes (Hetherington & Elmore, 2003).

Kerr, Beck, Shattuck, Kattar, and Uriburu (2003) also found that higher levels of parental monitoring and familial connectedness were consistently associated with less problem-behavior in adolescents as did Kirby (2001b) and Martyn and Martin (2003). With this in mind the value of statutes that allow adolescents to gain access to reproductive health care without parental consent may be seen as undermining parents' ability to monitor their teens and may not be in the best interest of the adolescent (Merrick, 1996).

Cauce, Stewart, Rodriguez, Cochran, and Ginzler (2003) consider that with an ecological model of development more distal risks will be filtered through more proximal environments allowing positive family and peer microsystems to decrease youth vulnerability. Luthar and Zelazo (2003) also emphasize the importance of the proximal environment of the family in resilience-based intervention for children stressing the importance of the quality of parent-child relationships. Yet, the riskier the setting, the less likely it is that protective factors will be present

Another aspect of many family microsystems is siblings. Having older sexually active siblings or pregnant/parenting teenage sisters increases teen risk (Miller, 2002). East and Kiernan (2001) found an even stronger correlation if teens

had two or more parenting sisters living with them. The younger sisters in these families had more permissive sexual beliefs and attitudes about having children and the younger brothers were engaged in sexual activity at younger ages than those without parenting teen sisters living with them.

Peer group interaction can also be viewed as a microsystem for influencing sexual behavior (Kalmuss et al., 2003). Social influences in the peer group, including having friends who are sexually active, significantly influences the adolescent's likelihood of becoming sexually active at an early age. For example, youth who perceive that their friends were engaging in high-risk behavior were more likely to engage in sexual risk taking (Boyer et al., 2000). Peers' norms and behavior regarding sex affect adolescents' sexual behavior (Kirby, 2001b).

The school microsystem could impact adolescent sexual risk taking as well (Kirby, 2002c). Involvement in school and attachment to school were all related to less sexual risk-taking and lower pregnancy rates in adolescents. Mothers' perceptions of a quality school environment were also correlated to adolescents being less likely to get into trouble (Kowaleski, 2000), and the Search Institute lists a caring school climate and clear rules and boundaries provided by schools as developmental assets or factors that protect youth against risky behavior (Benson, 1997).

Considering cultural impacts at the macrosystems level, even being exposed to the sexually explicit material that is so prevalent in our society can have a negative impact on attitudes and expectations as well as increasing the likelihood of sexual activity (Roberts, 1993; Strong, DeVault, & Sayad, 1996; Ward & Rivadeneyra, 1999). Ward and Rivadeneyra (1999) found not only viewing a considerable amount

but how involved the viewer was with the program impacted adolescents' sexual attitudes, expectations, and behavior. Those with greater exposure who also were more involved with the sexual content on T.V. were more likely to be accepting of recreational sex, believe more of their peers were sexually activity, and to be more sexually active themselves (Ward & Rivadeneyra, 1999).

At the macrosystem level, influential characteristics of communities may include risk factors or protective factors. Communities with more protective factors should be better able to deal with adversity. While positive relationships at the microsystem level can help counter negative community effects, the opposite effect is also possible where positive community environments can help counter negative influences that may occur at the microsystem level. Denner, Kirby, Coyle and Brindis (2001) found this to be the case where traditional values about family and community, close ties to religious institutions, monitoring youth, and being protective of girls in one Hispanic community resulted in lower teen birth rates than another community with similar socioeconomic factors that did not have these characteristics. Parental notification laws can be an asset to a community like this while statutes that undermine parental monitoring may put youth at risk. With this in mind, it is important to look at a community's sexual attitudes and norms, especially in those where a large percentage of teens are having sexual intercourse at young ages, to try and deter sexual initiation among youth (O'Donnell, Myint, O'Donnell, & Stueve, 2003). O'Donnell, O'Donnell, and Stueve (2001) also point out that these community factors must be taken into consideration when planning interventions, as programs are usually more effective if they are able to reach youth before they

become sexually active. In communities with high rates of early sexual activity among youth, interventions need to reach youth at younger ages since it can be very difficult to promote abstinence to students when the majority of them may already be sexually experienced.

Lammers, Ireland, Resnick, and Blum (2000) found higher socioeconomic status associated with lower levels of sexual activity and delayed onset of sexual activity. Seidman and Pedersen (2003) see the various effects of poverty cascading into the neighborhoods, schools, peer groups, and families and impacting the daily lives and experiences of adolescents. Poverty (also associated with low levels of education, poor schools, high unemployment, poor housing, increased divorce rates with more single mothers, higher levels of family dysfunction, and increased crime levels) was also found to impact teen birthrates (Kirby, Coyle, & Gould, 2001; Miller, 2002) indicating increased sexual activity among youth. Kowaleski (2000) found that residential stability decreased adolescent risk-taking attitudes, regardless of the level of disadvantage present within the community, so certain community characteristics can have a positive impact on behavior, even though others might have a negative impact.

Positive Youth Development

While looking at multiple environmental influences helps put adolescent sexual activity in context, much of the literature still emphasizes problems and deficits, perhaps with some attention to prevention. Changing the focus to the plasticity and strengths of adolescents and their families as well as their community contexts, it may be possible to capitalize on the strengths of developmental systems to

better promote healthy functioning and develop more effective and informed interventions (Lerner, 2003). Even if problems are prevented, adolescents may not, in reality, receive the support or the assets they need for optimal development. With a focus on resiliency, protective factors, and positive youth development communities can strive for the goal of not only "problem free" but "asset rich" youth (Benson, 2003). Yates, Egeland, and Soufe (2003) see resilience as an ongoing process of acquiring resources that can help adolescents adapt and provide them with a foundation for handling later challenges. Resilience is not viewed as the reason youth may do well when confronted with adversity but is more a developmental processes that helps youth gain the ability to use internal and external assets to realize positive adaptation even in the midst of adversity. When youth are in caring communities that support positive development, their ability to develop morally and better contribute to civil society is enhanced. Adolescents need to be provided with the individual and ecological assets that can help provide them with the "five C's" of positive youth development: competence, confidence, connection (to family, peers, and community), character, and caring/compassion (Lerner, 2003). Luthar and Zelazo (2003) see resilient adaptation as resting on good relationships.

The Search Institute's 40 developmental assets provide a guide for enhancing the strengths of individuals, families, and communities. When more assets are present the chances of healthy development increase (Lerner, 2003). In the presence of risk factors an additive or compensatory models suggests that more resources can decrease the negatives resulting in better outcomes while a moderating model would see these resources as decreasing the child's susceptibility to the harmfulness of the

stresses or risk factors or somehow protecting them from the negative effects expected from the threat (Masten & Powell, 2003). In one example the asset of positive parenting had the effect of lowering mental health problems for children exposed to the stress of parental divorce or death (Standler et al., 2003). Fergusson and Horwood (2003) suggest that factors can act additively and may mitigate or exacerbate the effects of exposure to childhood adversity. It is not usually a single factor that causes difficulties in adolescents, but an accrual of difficulty that decreases developmental capacity and it is not generally just one environmental factor that makes a difference but rather a collection of risk in each family's life (Sameroff, Gutman, & Peck, 2003). In a longitudinal study of Hawaiians born in 1955 Werner and Smith (2001) found that as the number of risk factors or stressful life events increased, more protective factors or assets were needed to counter act the negatives in the lives of these vulnerable children and to ensure positive developmental outcomes.

School success, leadership, valuing diversity, physical health, helping others, delaying gratification, and overcoming adversity were found to be indicators that youth were thriving (Lerner, 2003). Adolescents able to delay gratification and concerned with physical health would be more likely to abstain from sexual activity while the other factors also contribute to overall developmental health. Communities that show cohesiveness, caring, and compassion are better able to support adolescents and help them develop personal character and competence (Lerner, 2003). Communities with these assets are also better able to instill moral values and support spiritual and religious faith that also has a positive impact on adolescent development.

Positive youth development supports an ecological approach to human development. The macroecological level is where policy and political structures impact the community while communities strive to provide asset rich environments. The role of the family in linking youth to the community remains important especially when looking at parenting practices. Communities that focus on rebuilding and strengthening their developmental infrastructure with a mobilization of public will and capacity will likely fair better than those driven from the top down. Creating a culture where all residents promote the positive development of children and adolescents is a wonderful goal (Lerner, 2003). Asset building can occur from the individual-level with residents in informal relationships to the macrosystem level with community building helped by the local economic and governmental structures (Benson, 2003).

Furthermore, even gang youth have developmental plasticity and the potential for positive developmental change when linked in their ecologies to developmental assets (Taylor et al., 2002). Enhancing community resources and assets could even help youth with only a small number of assets to unlock their potential for positive development (Taylor et al., 2002).

This work of community-based human development or asset-based community and human development has a great impact on adolescent well-being. Vulnerable populations, in particular, are served by an infrastructure that distributes resources aimed at decreasing risks and promoting health. It is also important for communities to support infrastructure that provides safe places and adult connections while promoting competency building in youth. How attentive a community is to

these essential developmental needs determines the strength of the human development infrastructure of a community (Benson, 2003).

Having long-term relationships with non-related adults, feeling a connection to their neighborhood where other adults know and interact with them, and participating in caring and supportive schools have all been related to positive adolescent health outcomes (Benson, 2003). Transmitting values and standards, providing support, controlling behavior, and promoting belonging are all impacted by the consistent presence of adults in the community in a variety of contexts from the home setting to the neighborhood and religious settings (Benson, 2003). Werner and Smith's (2001) findings support this. Looking at long range outcomes what mattered most for the children followed in this longitudinal study was the emotional support of members of the extended family, of peers, and of caring adults not in their household, especially teachers and mentors who were able to serve as positive role models.

Sadly, assessment of developmental assets consistently finds that most adolescents have only small number of such supports. In a study comparing male gang members to community based organization members, Taylor et al. (2002) found that all youth had individual and contextual assets that could be used to promote positive behavior and development, though not nearly as many as would truly promote optimal development. While wealthier communities tend to have more assets, the difference is negligible. Decreases in sexual activity are noted with increases in assets (Benson, 2003). It seems that not only do "some kids need more" but "all kids need more" (Benson, 2003). Concerns abound regarding the increased chaos that seems to have infiltrated families, schools, and communities undermining

the stability that adolescents need for psychological growth (Benson, 2003). If youth can be exposed to asset-building people and environments within multiple contexts (developmental redundancy) and more assets can be provided to all youth (developmental reach and breadth) gains in positive youth development would be noted (Benson, 2003).

Individual adults willing to develop relationships with youth have the potential to have a positive impact. Positive peer groups can also be influential. Families, neighborhoods, schools and other organizations must work at positive socialization of youth. Even community policy, social norms, and special programs can provide needed assets to community adolescents (Benson, 2003). To have the most impact a critical mass of individuals and institutions needs to be focused on addressing the developmental needs of all community youth.

Thus, some of the factors that influence adolescent sexual activity may be open to intervention, though many are not. With this in mind, many intervention programs have sought to provide adolescents with the information they need to make informed decisions about their sexual activity while others have targeted broader areas of concern, still hoping for improved outcomes.

Interventions

Many approaches have been tried to minimize the consequences of adolescent sexual activity and provide youth with assets that might help them avoid high risk behaviors. An overview of these programs helps put this challenge in perspective. Programs varied from those with the goal of decreasing risking sexual behavior, to those aiming to reduce teen pregnancy, to others specifically promoting abstinence.

The CDC reviewed "Programs-That-Work". The programs that were found to reduce HIV, other STDs and unintended pregnancy included Reducing the Risk; Get Real About AIDS; and Safer Choices for high school students and Be Proud, Be Responsible; Becoming a Responsible Teen; Focus on Kids; Making a Difference; and Making Proud Choices for youth in community settings. While these programs met strict criteria for having a control group with at least a 4-week follow-up and published data, they do not necessarily promote abstinence, just risk reductions (Collins, Robin, & Wooley, 2002).

Most Americans support this comprehensive approach to sex education believing schools should teach both abstinence and give teens enough information to help them try to prevent unplanned pregnancies and STDs if they do decide to have sex instead of teaching only abstinence until marriage (Kaiser Family Foundation, 2003). Landry, Kaeser, and Cory (1999) express concern that one in three school districts surveyed did not allow any positive information about contraception to be provided to students. But, the results of a randomized controlled trial by Coyle et al. (2001) testing the effects of Safer Choices, one of the CDC's "Programs-That-Work", found that sexually active subjects were more likely to use condoms and had fewer partners but the subjects who had not previously been sexually active did not significantly delay the onset of sexual intercourse compared to those in the control group. While risk reduction is good, it is not 100% effective and still leaves teens at risk. The Physicians Consortium (2002) also reviewed these curricula and expressed concern that the claim stating they promote abstinence is deceptive and could

undermine the public's idea of what real abstinence education should be while actually promoting "safe-sex", which is not necessarily safe.

Kirby (2001a) also looked at programs to reduce teen pregnancy. This review found that the Children's Aid Society-Carrera Program provided the strongest evidence for impacting teen pregnancy while the Teen Outreach Program and Reach for Health Community Youth Service Learning were also effective. Kirby (2001a) suggests that professionals working with teens should continue to look at different ways to prevent teen pregnancy by building on the successful elements of different programs and exploring innovative approaches. Kirby (2002b) later found three additional types of programs that were effective. They included certain sex and HIV education curricula with specific characteristics, one-on-one prescribed clinician-patient interactions in health settings, and service learning programs. Most of the sex and HIV education programs emphasized abstinence as the safest choice but also provided information on condoms and other contraceptives. They provided information on the risks of teen sexual activity and activities addressing social pressures that can influence sexual behavior as well (Kirby, 2002b). The clinician-patient interventions were actually fairly brief but included the clinician having a one-on-one interaction with the patient giving a clear message about appropriate sexual and contraceptive behavior specific to the client (Kirby, 2002b). The success of the service learning programs may be attributed to increased feelings of autonomy and competence gained from the experience or the programs may have simply kept youth busy allowing less time for high-risk behaviors (Kirby, 2002b).

Another evaluation of the Carrera program found that it was very effective for female students who, after participation in the program, had significantly lower odds of being sexually active than those not in the program (Philliber, Kaye, Herrling, & West, 2002). It was not as effective with the male students, however. This may be due to the fact that males often become sexually active at younger ages than females so the male students may have already been sexually experienced and interventions have been found to work better with students who were not yet sexually active at the beginning of a program.

While these programs strive to decrease the consequences of adolescent sexual activity such as pregnancy and STDs they do not have the goal of promoting abstinence as their primary objective. Following are programs more specific to the promotion of adolescent sexual abstinence.

Overall, adolescents who make virginity pledges are much less likely to have intercourse than adolescents who do not pledge, but not necessarily in all circumstances (Bearman & Bruckner, 2001). Even so, the delay effect was found to be substantial. Pledging decreased the risk of intercourse substantially with pledgers becoming sexually active on average 27 months later than non-pledgers (Diggs et al., 2001). Diggs et al. (2001) and The Physicians Consortium (2003) believe the success of pledging is due to the way the pledge acknowledges that sexual activity can be controlled, puts the locus of control on the individual, and makes the youth choose purposefully to abstain, though there is really no way to control for self-selection bias in youth choosing to pledge. And, while Koshar (2001) and Mohn, Tingle, and Finger (2003) feel the impressive decline in teen pregnancy in recent years is due mainly to

teens choosing not to have sex, many youth are still engaging in sexual activity and the negative consequences continue to be a huge societal problem.

Rector (2002) looked specifically at abstinence programs that do not provide contraceptives or encourage their use and found them to be effective in reducing early sexual activity. Virginity pledge programs were found to dramatically reduce sexual activity in junior and senior high school students participating in abstinence programs and pledging to remain abstinent. Rector (2002) also found Not Me, Not Now and Operation Keepsake both dropped sexual activity rates among participants compared to control school youth as did Abstinence by Choice and Teen Aid and Sex Respect. Other successful programs included Family Accountability Communicating Teens Sexuality, Postponing Sexual Involvement, Project Taking Charge, and Teen Aid Family Life Education Project (Rector, 2002). Promoting true abstinence education may be essential to reducing childbearing outside of marriage, preventing STDs, and improving emotional and physical well being for youth. It can help them to develop an understanding of commitment, fidelity, and intimacy that serves as the foundations of healthy marital life in the future (Rector, 2002).

One mass media campaign to prevent teen pregnancy included a component stressing abstinence. It found statistically significant changes toward abstinence with the percentage of students who self-reported having sex by the time they reached 15 dropping from 46.6% to 31.6% (Doniger, Adams, Utter, & Riley, 2001). It also found a decrease in the teen pregnancy rate from 63.4% to 49.5% showing that the change in self-reported sexual activity was not likely due just to social pressure to deny being sexually active (Doniger et al., 2001).

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A school-based intervention for urban youth used the Postponing Sexual Involvement Curriculum (Aarons et al., 2000). This study found that intervention group females were more likely to report virginity, self-efficacy to refuse sex with a boyfriend, and the intention to avoid sexual involvement during the following 6 months. Intervention group males scored significantly higher than their control-group counterparts in knowledge of birth control method efficacy but no change in attitudes toward abstinence was observed.

Another program compared safer-sex education with abstinence education (Jemmott, Jemmott, & Fong, 1998). This program used eight 1-hr modules with adult facilitators or peer co-facilitators and found that the abstinence intervention participants were less likely to report having sexual intercourse in the 3 months after intervention than the control group, but the difference did not continue to the 6 and 12 month follow up.

Following youth for 6-12 months, Aten, Siegle, Enaharo, and Auinger (2002) used a control and 3 intervention groups of middle school students to compare no intervention, ethnically diverse male-female pairs of adult professional educators, male-female pairs of extensively trained high school peer educators, and school district health teachers. The intervention was effective for regular teacher taught students and peer-taught males and for those who were not already sexually experienced at the beginning of the study.

Lieberman, Gray, Wier, Fiorentino, and Maloney (2000) found a small-group abstinence-based intervention somewhat beneficial. Focusing on mental health had

some impact on adolescents' attitudes and relationships but was more helpful for teens who were not already sexually active.

In addition to simply providing health instruction, adding a service learning intervention with community involvement has been shown to have the long-term benefit of reducing sexual risk taking among urban adolescents (O'Donnell et al., 2002). Kirby (2002b) also found that service learning interventions decreased teen pregnancy. This suggests that interventions focused beyond the basic microsystem level can also be beneficial and that increasing developmental assets does have a positive impact.

These programs provide a sample of the variety of interventions that have been attempted, some working better than others. Many programs have focused on sex-education, either abstinence only or abstinence plus information on safer sex. While some studies have shown that this is indeed helpful and that adolescents can make rational choices based on the potential consequences (Altman-Palm & Tremblay, 1998; Blinn-Pike, 1999; Goldfarb, Duncan, Young, Eadie, & Castiglia, 1999) other studies indicate that just providing information may impact attitude but this does not necessarily lead to a change in behavior (Arnold, Smith, Harrison, & Springer, 1999; Kirby, Korpi, Barth, & Cagampang, 1997) or these studies did not measure the impact on behavior (Agha, 2002; Spear, Young, & Denny, 1997). Many different programs have shown encouraging outcomes, while some have had more mixed results. Some of the successful programs have included a pledge to abstain from sex and programs geared toward youth who were not already sexually active have had better outcomes. Other programs, which may or may not have strong sex

education components, but have stronger community involvement or service learning, have demonstrated some positive outcomes. One common aspect of these programs is their increased intensity with program leaders committed to a substantial investment of time with youth. Yet is there more to promoting abstinence than just the intervention?

Specific Processes and Contexts of Adolescent Sexual Activity

The developmental stages through which youth progress may also impact behavior. While environmental influences may account for much of adolescent behavior and interventions can certainly contribute to more positive outcomes, understanding developmental processes and providing developmentally appropriate interventions may be helpful.

Youth cognitive interpretation and perception of risk factors.

Ajzen and Fishbein (1980) see humans as capable of making rational decisions based on the information available to them. People's intentions are based on their attitude toward the behavior or their judgment of whether they think it is good or bad as well as their perceptions of social pressures related to the behavior. They look at external variables or environmental impacts only in how they might affect people's attitudes about the behavior or their perceptions of social acceptance of the behavior. This view can serve as a model of the cognitive processes underlying adolescent choices about sexual activity (Gillmore et al., 2002). Adolescents should have the cognitive ability to formulate rational behavioral intentions based on perceived attitudes about the risks and benefits associated with engaging in sexual activity. Hutchinson (1999) found that youth who were consistent in using condoms and who

did not think their partners were infected with any STD's did not feel at risk of contracting an STD. This is an example of how adolescents can perceive risk logically (though it is unclear just how protective condoms really are against potential STD's and especially uncertain how accurate teens' perceptions are that their partners do not have an STD).

This approach argues that youth consider both the benefits and costs associated with engaging in sexual activity, and are likely to avoid it if the costs far outweigh the benefits (Mullan, Duncan, & Boisjoly, 2002). Measures of past behavior may be used to predict intentions and can impact the affects of attitude. A study by Sutton, McVey, and Glanz (1999) found that past behavior was predictive of adolescent intentions and attenuated the affects of attitude and subjective norms on behavior. Even so, they concluded that these beliefs about costs and benefits may be impacted by information-based intervention programs. Hulton (2001) found that environmental factors such as parental influences as well as social influences and perception of benefits were factors related to the decision that adolescents make to become sexually active or to abstain from sexual activity.

Donnelly, Eburne, and Eadie (1999) believe that youth have a tendency to see themselves as invulnerable to the potentially negative consequences of high-risk behavior. They propose educating students about risk management to help overcome this perception. This is supported by Anderson et al. (2001) who found that sexually active youth in juvenile detention facilities did not think their sexual behavior could result in their contracting a sexually transmitted disease. Another study of adolescent females with risk factors showed that they did not perceive themselves to be at risk

either (Morrison-Beedy et al., 2003) while Porter et al. (1999) found that increases in the frequency of intimate behaviors and an increase in time alone and opportunity for sexual activity had more of an impact on progression to sexual activity than any shifts in perceived costs and benefits.

Awareness of the risks associated with high-risk sexual behavior alone does not seem to be enough to change the behavior of many adolescents, though. Cohen and Bruce (1997) found no correlation between perceived probability of HIV or Chlamydia infection and frequency of risk-reducing behaviors in a group of college students. Boyer et al. (2000) found that youth were able to judge their increased level of STD risk as their sexual risk taking increased. While they may have felt at increased risk the lack of a negative outcome or their feelings that the consequences of an STD or pregnancy would not have a long term negative effect on them may have contributed to their continuing in the behavior. Perhaps they just do not see the benefits of abstaining from sexual activity as outweighing the perceived benefits of engaging in sexual activity. A study of sexually active female college students showed that less than half used condoms for protection, regardless of the type of partner and the level of risk of STDs or HIV (Williams et al., 2003). Another study found that college students' sexual risk behaviors were tied more to their perceptions of the benefits of unprotected sex (Parsons et al., 2000). These adolescents saw the benefits of unprotected sex as greater than the costs or possible negative results. Based on another study Parsons et al. (1997) also see the youth's perception of the benefits having a greater impact on risk-taking behavior than their view of the potential costs. Nangle and Hansen (1998) believe cognitive behavior skills

interventions that directly teach adolescents new skills are an important component to impacting behavior.

The adolescent personal fable.

Since looking exclusively at the cognitive processes underlying adolescent choices about sexual activity helps little in understanding adolescent behavior, the adolescent personal fable, first described by Elkind (1979), is a concept that could help better explain why youth may choose to engage in risky behavior even when aware of the potential consequences. Most adolescents have the knowledge to perceive risk correctly; yet do not integrate these risks in their decision-making. Personal fable is characterized by the incapacity of youth to see themselves as similar to others, so youth feel unique and self-focused believing that the risks that apply to others do not apply to them (Greene, Rubin, & Kromar, 2002). When youth believe the natural laws that apply to others do not affect them they may have feelings of immortality. Egocentric adolescents cannot believe that anything bad can happen to them (Buis & Thompson, 1989). Frankenberger (2000) looked at this personal fable and found that in addition to adolescents it also seemed to extend into early adulthood. The belief that adolescents and even young adults may have that the bad things that happen to others won't happen them should also be considered when looking at all the ecological factors that can impact behavior (Knoppers, 2003a). While this concept is not new, longitudinal studies on the topic are lacking, making it unclear if youth stating after the fact that "I didn't think it could happen to me" held this belief initially or only in a more retrospective manner (Vartanian, 2000).

Traditionally, changes in cognitive development as youth move from childhood into adolescence have been used to explain the personal fable. More recently the personal fable has been viewed in relation to socio-cognitive development and the work of separation (Goosens, Beyers, Emmen, & van Aken, 2002). The related concept of willingness to take risks has also been viewed as a developmental phenomenon, possibility related to an inability to assess the extent of risk in a given situation. This developmental immaturity or lack of experience may cause an adolescent to misjudge risk (Green, Kromar, & Walters, 2000). If youth don't perceive a risk it is more a matter of lack of recognition than an error in judgment. This may help explain how adolescents seem to ignore messages meant to help them make healthier choices (Green, Kromar & Walters, 2000). The personal fable fits in this perspective with its emphasis on youth's uniqueness and invulnerability, which is believed to peak in the late junior high and early senior high years. Green, Kromar, and Walters (2000) see the personal fable and more particularly feelings of invulnerability as negatively associated with adolescent's ability to perceive risks as well as their intentions to avoid the risky behaviors and found the highest levels of sexual risk-taking were reported in those with high feelings of invulnerability and sensation seeking.

It is unclear, however, what factors contribute to youth having or not having strong feelings of invulnerability. If youth feel invulnerable to the negative consequences of sexual activity they are more likely to feel the benefits of engaging in sexual activity outweigh the potentially negative consequences that they do not think will happen to them. While extensive research has been done on many aspects

of adolescent sexual activity, little has been done on this topic. A review of the literature searching CINALH, Education Abs, MEDLINE, ERIC, Soc Abs, Social Science Abs, and Wilson Select Plus showed very little in regards to adolescent invulnerability related to sexual abstinence or sexual activity other than those mentioned above.

Does this personal fable prevent adolescents from benefiting from the education most receive and inhibit them from making rational choices based on the actual likelihood of negative consequences? Chapin's (2001) findings that high-risk African American youth perceived themselves to be less likely than their peers to become pregnant or cause a pregnancy would support this. Klaczynski and Fauth (1996) also found that adolescents believe that they are less likely to suffer unwanted effects than their peers, and may also have strong feelings of being physically and socially indestructible. Jack (1989) found that repeated comments from youth such as "I didn't think it would happen to me" support the idea that they really do feel invulnerable. A better understanding of these feelings of invulnerability could help guide those trying to decrease adolescents' sexual risk-taking (Jack, 1989). While risk-taking and experimentation during adolescence may help them achieve a sense of independence and self-identity, finding a way to balance this against the potential consequences is important.

Yet, what is the influence of perceived invulnerability in relation to other known and measured risk or protective factors for adolescent sexual activity? If feelings of invulnerability to the potential negative consequences of sexual activity do influence adolescents' intentions, are there interventions that could minimize this

effect, helping teens realize their vulnerability so they might make wiser decisions about their sexual activity? Out and Lafreniere (2001) found that after 2-3 days of caring for a Baby Think It Over teens were better able to accurately assess their personal risk for an unplanned pregnancy than teens in the comparison groups, but the study did not follow up to see if this actually resulted in fewer teen pregnancies. Interactive computer games may be another way to help youth realize their vulnerability. Virtual reality simulations could allow youth to safely explore the possibilities and even experience the virtual consequences of their behavior (Knoppers, 2003a). While early versions of computer programs showed positive behavior changes and recent anecdotal evidence is encouraging, this type of intervention warrants further investigation (Knoppers, 2003a).

Risk and protective factors.

Perkins et al. (1998) examined the following 12 risk factors of adolescents' sexual activity: age, alcohol use, physical abuse, sexual abuse, GPA, suicidal ideation, religiosity, parental monitoring, family support, time spent home alone, membership in negative peer group, and perception of school climate. Those most highly correlated with adolescent sexual activity were alcohol use, sexual abuse, GPA, and membership in negative peer group. While Perkins et al. (1998) did not find parental monitoring (in this study, measured only by a single item) or family support predictive of adolescent sexual activity other studies have (Blum & Rinehard, 1997; Luster & Small, 1994; Wu et al., 2003). The results (Perkins et al., 1998) for religiosity were mixed, varying by gender and ethnicity with low religiosity not correlating for African American males nor Latina females. Perkins et al. (1998) also

had mixed results for perception of school climate, which correlated for males, but not females. Blum and Rinehard (1997) found both perception of school climate and religiosity to correlate to adolescent sexual activity, though this study did not separate youth by ethnicity nor gender.

Mullan et al. (2002) as well as Talashek et al. (2003) looked at additional factors to be considered such as socio-economic status and family structure while Kalil and Kunz (1999) also included family size, minority status, and maternal education, as did Small and Luster (1994) for parental education. Perceived parent disapproval of sexual activity and parent/adolescent activities were included by Blum and Rinehard (1997) as were perceived risk of untimely death and school connectedness.

Many of the factors impacting adolescent sexual activity can be viewed as risk factors or conversely as protective factors. If low GPA is a risk factor, having a high GPA is a protective factor. Fergusson and Horwood (2003) present the idea that to be meaningful, protective factors should be something more than the opposite of risk factors. Some posit that the effect of a protective factor would be negligible in lower risk populations but would be intensified in the company of one or more risk variables. Protective factors should have an impact only in the face of hardship. But others have used protective factors to describe values associated with advantageous outcomes free of the occurrence of social disadvantage or unfavorable conditions or even the positive role of risk factors perhaps better called promotive factors (Sameroff, Gutman, & Peck, 2003).

An interactive relationship of the protective factors, the risk exposure, and the outcome may result in the protective factor having beneficial effects on those exposed to the risk factors that might not benefit those not exposed to it (though this framework does not always fit). Two types of processes may lead to resilience. These are protective processes and compensatory processes (Fergusson & Horwood, 2003). Intelligence and problem-solving abilities, external interests and affiliations, parental attachment and bonding, and peer factors are examples of factors that may contribute to resilience in children raised in high risk environments (Fergusson & Horwood, 2003). Resilience factors may produce an effect by compensating for childhood adversity not necessarily by acting in a protective role (Fergusson & Horwood, 2003). Seidman and Pedersen (2003) took a holistic and contextual approach in looking at risk/protection and competence and found multiple forms of contextual competence suggesting the need to engage youth positively with two or more settings.

While it is helpful to look at these factors it is challenging to try to pinpoint which ones might have the most impact when there are so many environmental elements. The Search Institute's forty developmental assets (Benson, 1997) can help in gaining an understanding of the bigger environmental picture. The external assets grouped under support, empowerment, boundaries and expectations, and constructive use of time focus on the environment while the internal assets grouped under commitment to learning, positive values, social competencies, and positive identity are based at the individual level.

In an ambitious review of over 250 articles Kirby (2002a) found more that 80 antecedents to initiation of sex. The majority of them were at the individual level yet

many were environmental or contextual factors. Trying to place these factors in a developmental and ecological framework viewing adolescents within the complicated ecology of their families, peers, schools, and neighborhoods remains a challenge (Gorman-Smith, & Tolan, 2003). This is a critical step in trying to target interventions instead of simply listing corollary factors. Lists of protective factors have limited practical use because all itemized indicators can never be addressed in a given intervention (Luthar & Zelazo 2003) but may still be an important step in promoting positive youth development.

Individual factors include alcohol use, GPA, suicidal ideation, and religiosity, though even these are also impacted by the environment. Additional factors identified in Kirby's (2002a) review include those under the groupings of biological; race/ethnicity; healthy behaviors; other problem or risk-taking behaviors; attachment to and success in school; working more then 20 hours a week; emotional well-being and distress; and sexual beliefs, attitudes, skills, and behaviors. Masten and Powell (2003) also saw individual differences including cognitive abilities, self-efficacy and self-esteem, temperament, impulse control, and positive outlook on life as factors that increase adolescents' resiliency and ability to overcome adversity for better outcomes.

Looking at the family microsystem parental monitoring, family support, time spent home alone, family size and structure, parent's education, and parental approval or disapproval of adolescent sexual activity can all impact adolescent sexual behavior. Kirby (2002a) also identified that having a working mother, being a younger sibling and having older siblings who have been sexually active or gave birth as adolescents

were risk factors while higher income level, having health insurance, and the mother being older at first sex and first birth were protective factors. Greater family religiosity can also impact at this level in addition to the individual level (Kirby, 2002a). Factors such as physical and sexual abuse often occur in the family microsystem as well, but may also occur in extra familial settings.

The peer microsystem also plays a part. Beal, Ausiello, and Perrin (2001) looked at parent disapproval of health-risk behaviors, parent modeling of health-risk behaviors, parent monitoring of health-risks, peer disproval of health risks, and peer modeling of health-risk behaviors. They found that peer social influences were more evident than parental influences in impacting sexual activity in 7th graders attending an urban magnet middle school. Perception of peers' sexual behavior can also influence adolescent behavior, perhaps even more than the peers actual behavior (Nahom, Wells, Gillmore, 2001). Also at the peer group level, having older friends, having peers with lower grades who drink or have permissive attitudes toward premarital sex, having sexually active peers, dating alone, going steady and having older romantic partners were risk factors (Kirby, 2002a). A protective factor at this level is having close friends who are close to their parents (Kirby, 2002a).

Another important microsystem is the school. Attending a parochial school was a protective factor for youth while being popular with peers and engaging in physical fights were risk factors (Kirby, 2002a). Being connected to school, though more at the individual level, was a protective factor (Kirby, 2002a).

Larger societal issues at the macrosystem level like socioeconomic status and being a minority are also important. Other community antecedents include higher

divorce rates, higher rates of residential turnover, and higher unemployment rates (Kirby, 2002a). Kirby (2002a) also identified living in a community with a higher percentage of college educated people, higher family income and greater neighborhood monitoring by the adults as protective factors.

Yet, with this large amount of research, few studies look at the individual factor of perceived invulnerability to the potential consequences of sexual activity and none were found that used a longitudinal approach to assess its relationship to initiation of sexual activity. Chapin (2001) found a correlation between high feelings of perceived invulnerability and feelings of being less susceptible to the consequences of sexual risk taking. Youth who consistently used condoms and believed that their sexual partner was not infected with an STD perceived themselves to be at no risk of contracting an STD (Hutchinson, 1999). Pete and DeSantis (1990) found that a belief in their lack of vulnerability to become pregnant correlated with sexual activity in young black adolescent females while Quandrel, Fishchhoff, and Davis (1993) found that most adolescents perceived themselves to be at less risk than others but this study did not look at how this impacted the adolescents' intentions regarding sexual activity or their behavior.

Looking at how these factors correlate to adolescent behavior regarding sexual activity may give suggestions on helpful interventions to promote sexual abstinence. Data on individual factors obtained using multiple questions should make it easier to ascertain subtle differences in environmental influences but lengthy measures that could increase the risk of subjects not completing the questionnaire need to be avoided. It is also important that the questions use the highest level of measurement

feasible to provide more useful data using ordinal or interval level data over nominal level data whenever possible.

Conclusion

Numerous studies have shown that multiple factors impact adolescent transition to sexual activity. These factors occur at the individual, family, and extra-familial levels. In addition, a variety of programs to delay onset of adolescent sexual activity have been tried. Programs ranging from abstinence only, to abstinence plus information on safer sex, to programs promoting community involvement and service learning have all shown some potential. Yet, with this great body of research, the concept of feelings of invulnerability has rarely appeared. If feelings of invulnerability impact adolescent sexual behavior, gaining an understanding of this relationship could help in planning interventions. It is apparent no one factor can account for adolescent sexual activity, but a combination of factors may give a clearer picture. This study takes an ecological perspective to understanding adolescent sexual activity looking specifically at an individual factor, the little explored concept of perceived invulnerability, in relation to risk factors associated with significant contexts of sexual activity and other individual factors.

Chapter 3

Methods

Purpose of the Study

The purpose of this study was to answer these questions: 1) What is the relationship between youths' perceived invulnerability to pregnancy and STDs and behavior regarding sexual activity? 2) What is the relationship between youths' perceived invulnerability to pregnancy and STDs and behavior regarding sexual activity when other predictors of sexual activity are considered (i.e. controlled)? 3) How does perceived invulnerability impact adolescents with few risk factors and more protective factors compared to those with multiple risk factors and few protective factors? This study also adressed questions about how the individual risk and protective factors for adolescent sexual activity as well as factors at the mircrosystem and macrosystem levels relate to feelings of invulnerability.

Definitions and Measures

This study used a tool with questions adapted from the Dane County Youth Assessment 2000 (University of Wisconsin Board of Regents, 1999), the invulnerability scale from Lapsley's New Personal Fable Scale (Lapsley, FitzGerald, Rice & Jackson, 1989) and additional questions developed by the researcher providing basic demographic information as well as data on risk and protective factors and feelings of invulnerability. (See Appendix A for specific questions from the Youth Assessment Tool.)

General definitions and measures.

Youth: Youth is defined as students ages 12 to 19 years of age (question 3).

Perceived invulnerability to pregnancy and STDs: This is the youth's belief that he/she will not get pregnant (or impregnate partner) and the belief that he/she will not contract one of many sexually transmitted diseases if he/she engages in unprotected sexual activity as measured by self report on four items on the Youth Assessment Tool (questions 15, 16, 25, and 26). Low scores on 15 and 16 (reverse coded) and high scores on 25 and 26 indicate higher levels of perceived invulnerability with total scores ranging from 0 for the lowest level of invulnerability to 16 for the highest level of invulnerability. Cronbach's alpha for this grouping of questions was .75. With the low reliability of this four item scale, possibly related to the reverse coding of two of the questions, the two sets of questions were analyzed separately. Using a Spearman's *rho* the first two questions had a .84 correlation coefficient with an alpha of $< .01$ while the Spearman's *rho* for the second two measures had an r of .76 also with an alpha of $< .01$. The scores for the personal fable vulnerability scale (47-60), some which were reverse coded, range from 0-56. The Cronbach's alpha for these questions (47-60) was .56. After performing a factor analysis showing the five items with the highest loading on the first factor, Cronbach's alpha was run on only these factors (questions 51, 53, 57, 59, and 60 in Appendix A) resulting in an alpha of .65.

Sexual activity: Sexual activity is defined as sexual intercourse measured by self-report (question 18) as well as frequency of sexual activity in past 3 months (question 19), number of lifetime partners (question 20), and if drunk or high with sexual activity (question 21). For question 18 scores range from 0 to 7 with higher

scores indicating earlier age of sexual initiation. For questions 19-21 individual scores range from 0-6 with higher scores indicating higher risk behavior.

STDs: This is a self report of sexually transmitted disease history as measured by the Youth Assessment Tool (question 22).

Birth control use: This is self report of use of birth control as measured by the Youth Assessment Tool (question 23) with scores ranging from 0 for those who have not been sexually active to 6 for those who are sexually active and have never used birth control.

Pregnancy: Pregnancy is defined as self report of having been pregnant or causing a pregnancy as measured by the Youth Assessment Tool (question 24).

Risk factors: Risk factors are characteristics of the youth that may have a negative impact on behavior as measured by the Youth Assessment Tool. These include low GPA, single parent home, low parental education, history of sexual or physical abuse or witnessing physical abuse, parental approval for sexual activity and alcohol consumptions, and negative peer group.

Protective factors: Protective factors are characteristics of the youth that may have a positive impact on behavior as measured by the Youth Assessment Tool. These include high GPA, living with both parents, high parental education, increased religiosity, caring community, increased parental monitoring and support, and belief that youth should not have sexual intercourse.

Specific risk and protective factors: definitions and measures.

GPA: GPA is the average grade the youth usually gets in school courses as measured by self report (question 4). Scores on this question range from 0-7 with

higher scores indicating lower grades and higher risk while lower scores indicate higher grades and lower risk.

Family structure: Family structure is defined as who the youth lives with most of the time and if parents are divorced or separated as measured by 2 questions on the Youth Assessment Tool (questions 6 and 9).

Parental education: This is how much education mother/stepmother and father/stepfather completed as measured by 2 questions on the Youth Assessment Tool (questions 7 and 8). Scores range from 0 to 6 and -7 with lower scores from 0 to 6 indicating more education and less risk combining for a maximum of 12 and a score of -7 indicating the youth does not know the amount of education that parent had causing exclusion from analysis for this item. Using a Spearman's *rho* these two measures had a .56 correlation coefficient ($p < .01$).

Substance use: Substance use is defined as use of tobacco, alcohol, marijuana, and other drugs as measured by 5 questions on the Youth Assessment Tool (questions 10-14). Total scores range from 0 to 25 with higher scores indicating increased substance use. This scale had a Cronbach's alpha of .83.

Religious beliefs/activities: Religious beliefs/activities is defined as how important religion/religious beliefs and religious activities are to the youth as measured by 2 questions on the Youth Assessment Tool (questions 17 and 27 with question 27 reverse coded). Scores range from 0 to 8 with higher scores indicating decreased religiosity and higher risk. The Spearman's *rho* was .68 for these two items with ($p < .01$).

Sexual abuse: This is report of sexual abuse as measured by the Youth Assessment Tool (question 28).

Physical abuse: Physical abuse is defined as report of physical abuse as measured by the Youth Assessment Tool (question 29).

Witnessing physical abuse: This is report of witnessing physical abuse as measured by the Youth Assessment Tool (question 30).

Caring Community: Caring community is defined as report of helping neighbors, watchful adults and caring community as measured by 3 questions on the Youth Assessment Tool (questions 31-33). These questions had total scores ranging from 0 to 12 with lower scores showing stronger community and lower risk. The Cronbach's alpha for this scale was .71.

Parental monitoring: Parental monitoring is report of parental monitoring of youth activity as measured by 4 questions on the Youth Assessment Tool (questions 34-37, all reverse coded). Scores from 0 to 4 on each question after reversal could result in a maximum of 16, indicating low parental monitoring and higher risk. The Cronbach's alpha for this scale was .89. Scores of -5 on any of the questions indicate no adults at home and were not included in the calculated scores, excluding them from analysis.

Parental support: Parental support is defined as perception by youth that parents are there for them and care as measured by 2 questions on the Youth Assessment Tool (questions 38 and 39, reverse coded). Scores from 0 to 4 on each question could result in a maximum of 8, indicating low parental support and higher risk, resulting in a Spearman's *rho* of .66 with an alpha of $< .01$. Scores of -5 on

either question indicate no adults at home and were not included in the calculated scores.

Parental approval of adolescent sexual activity and alcohol consumption: This is defined as youth report of parents approval of teen sexual activity and alcohol consumption as measured by two questions on the Youth Assessment Tool (questions 40 and 41). Scores range from 0 to 4 on each question with higher scores indicating higher parental approval for these behaviors and higher risk.

Peer group: Peer group is report of friends getting youth into trouble, sexual activity, drinking or drug use, and tobacco use as measured by 4 questions on the Youth Assessment Tool (questions 42-45). Scores from 0 to 3 on each question could result in a maximum of 12 with low scores for positive peer group and higher scores with more negative peer group and higher risk. These items had a Cronbach's alpha of .90.

Youth's sexual beliefs: This is defined as youth's belief that teens should not have sexual intercourse as measured by the Youth Assessment Tool (question 46). Scores range from 0 to 3 with lower scores indicating belief that teens should not have sexual intercourse.

Research Design

The study was a cross-sectional survey, designed to examine the relationship between perceived invulnerability to pregnancy and STDs and sexual activity. The study also addressed perceived invulnerability in relation to other risk and protective factors.

The Sample

The target population was youth involved with programming through the Kent County Coalition on Adolescent Choices in Health (COACH) and Wedgwood Christian Services. The sample was drawn mainly from youth participating in Life Skills programs in Kent County, Michigan. Participants were all able to read and write English. Subjects consisted of all youth attending Life Skills programs willing to participate with parental consent. This resulted in a convenience sample of youth from COACH programs in Kent County. While this decreases the generalizability of the study, the groups included youth from different socio-economic and racial groups making the findings more useful.

Data was collected during the regular Life Skills group time. Parental/guardian consent was obtained before data collection (see Appendix B). The group facilitator for each group explained the study and the need for parental consent to each youth when handing out the consent forms. All willing youth who had returned parental consent participated in the survey. Youth aged 18 and 19 were able to sign their own consent forms (see Appendix C).

The socio-demographic make up of youth participating in COACH programs is quite varied. The socio-economic and racial make up of youth attending past Life Skills programs depended on the location of the group. Some sites are mainly low income African American, some highly Hispanic, and others with a higher proportion of white students. COACH programming targets high-risk youth so usually includes a high percentage of low-income youth, though some middle class youth also attend.

Using a standard alpha of .05 for a one-sided test with a beta of .2 for 80% power, the total sample size required for a correlation coefficient with a modest effect size of .3 is 67. Realizing that many factors in addition to perceived invulnerability may contribute to an adolescent's decisions about sexual activity, the larger the sample the better chance of being able to detect even a small correlation between perceived invulnerability and behavior regarding sexual activity. While youth may not enjoy the time the data collection takes, the time was scheduled so they did not miss any other group activities while filling out the survey.

Method of Data Collection

The investigator used a tool adapted from the Dane County Youth Assessment 2000 Survey (University of Wisconsin Board of Regents, 1999), along with the invulnerability subscale of Lapsley's New Personal Fable Scale (Lapsley, FitzGerald, Rice, & Jackson, 1989), and additional questions developed by the researcher (see Appendix A). The Dane County Youth Assessment 2000 survey includes basic demographic information, questions on grades, living situation, substance use, personal issues (including sexual activity), opinions about the community, their family, and other views and opinions. The invulnerability subscale of Lapsley's New Personal Fable Scale focuses on the vulnerability piece of the personal fable concept with some of the questions reverse coded.

Reliability and validity of measures.

Due to the nature of the survey tool, assessing reliability is challenging. Because the factors being measured are likely to change over time, testing tool stability would not be useful. Test equivalence is not feasible as no other tools were

found that test this range of risk and protective factors along with invulnerability, and developing another tool for alternate form testing would be too time intensive for the youth being asked to fill out two similar surveys. The 14 invulnerability subscale items from the New Personal Fable Scale (Lapsley, FitzGerald, Rice, & Jackson, 1989) had a reliability of .79 for Greene, Kromar, and Walters (2000), though a review of the literature was unsuccessful in finding additional reports for this scale. For measures with multiple questions, Cronbach's alpha was obtained.

Content validity of the tool was determined by a review of the literature. This was also affirmed by researchers familiar with this field of study. Reviewers provided feedback and suggestions about inclusion and exclusion of topics as well as overall ease of use of the tool.

Study implementation.

Human subject application was submitted by the researcher to MSU Human Subjects Committee, UCRIHS, and approval was obtained. The researcher submitted appropriate documentation to the research committee at Wedgwood which reviewed the study proposal and granted permission for data collection. Wedgwood is the fiduciary agency for the Coalition on Adolescent Choices and Health (COACH) in Kent County, which hosts the Life Skills programs and other groups. COACH is a community coalition made up of concerned citizens and representatives from public and private agencies involved with promoting positive youth development. The main goal of COACH is to help youth make healthy choices regarding abstinence from sexual activity, tobacco, alcohol, and other drugs. Wedgwood is supportive of

research that would help provide insight into these issues and was eager to help facilitate this process.

The researcher copied all materials and provided information to group facilitators on obtaining informed consent and data collection. Data collection began fall of 2004 and was completed mid summer 2005.

Hypotheses

This study tested many hypotheses. Hypotheses addressing the main research questions related to specific sexual behavior and the potential relationship of feelings of invulnerability to that behavior. Keeping with an ecological focus, hypotheses addressing individual as well as microsystem and macrosystem level risk and protective factors and how they related to feelings of invulnerability were also included.

Hypotheses relating to specific sexual behavior.

#1) Youth with higher perceived invulnerability will be more likely to be sexually active.

#2) Youth with higher perceived invulnerability will have greater frequency of sexual activity.

#3) Youth with higher perceived invulnerability will have a greater number of lifetime partners.

#4) Youth with higher perceived invulnerability will more frequently have sex while drunk or high.

#5) Youth with higher perceived invulnerability will have greater use of birth control.

#6) Youth who have ever had an STD will have lower levels of perceived invulnerability.

#7) Youth who have ever been pregnant or gotten someone pregnant will have lower levels of perceived invulnerability.

#8) Youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled.

#9) Perceived invulnerability will have less impact on the sexual behavior of youth with few risk factors and more protective factors while having a greater impact on those with multiple risk factors and fewer protective factors.

Hypotheses relating to individual risk factors.

#10) Younger youth will have higher levels of invulnerability.

#11) Youth who use alcohol or drugs will have higher levels of invulnerability.

#12) Youth with a history of sexual abuse will have lower levels of invulnerability.

#13) Youth with a history of physical abuse will have lower levels of invulnerability.

#14) Youth who have witnessed physical abuse will have lower levels of invulnerability.

#15) Males will have higher levels of invulnerability

#16) Minority youth will have higher levels of invulnerability.

#17) Youth with higher GPAs will have lower levels of invulnerability.

#18) Youth with strong religious beliefs will have lower levels of invulnerability.

#19) Youth who believe that teens should not have sexual intercourse will have lower levels of invulnerability.

Hypotheses relating to microsystem factors.

#20) Youth who live with both parents will have lower levels of invulnerability.

#21) Youth whose parents have never been divorced or separated will have lower levels of invulnerability.

#22) Youth with higher levels of parental monitoring will have lower levels of invulnerability.

#23) Youth with higher levels of parental support will have lower levels of invulnerability.

#24) Youth who have parents with higher levels of education will have lower levels of invulnerability.

#25) Youth with parents who are more approving of adolescent sexual activity will have higher levels of invulnerability.

#26) Youth with parents who are more approving of adolescent alcohol consumption will have higher levels of invulnerability.

#27) Youth who report having friends who get into trouble, are sexually active, drink or use drugs, or smoke will have higher levels of invulnerability.

Hypothesis relating to macrosystem/community factors.

#28) Youth reporting supportive communities will have lower levels of invulnerability.

Data Analysis for Hypotheses

Frequencies were run on basic demographic information. For the research question: "What is the relationship between youths' perceived invulnerability to pregnancy and STDs and sexual activity?" and the hypotheses that youth with higher perceived invulnerability will be more likely to be sexually active, have greater frequency of sexual activity, have a greater number of lifetime partners, have greater use of birth control, and will more frequently have sex while drunk or high a Spearman's r*ho* was used to look at the correlation between feelings of invulnerability and sexual activity, frequency of sexual activity, number of lifetime partners, use of birth control and frequency of sex while drunk or high for the study group. For the hypotheses that youth who have ever had an STD and who have ever been or gotten someone pregnant will have lower levels of perceived invulnerability an independent samples t test were run.

For the second research question: "What is the relationship between youths' perceived invulnerability to pregnancy and STDs and sexual activity when other predictors of sexual activity are controlled?" and the hypothesis that youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled logistic regression was used. For the hypothesis that perceived invulnerability will have less impact on adolescents with few risk factors and more protective factors while having a greater impact on those

with multiple risk factors and few protective factors logistic regression was also be used.

For variables measured using interval scales it was hoped a Pearson Product Moment Correlation Coefficient (*r*) could be used to test the research questions about how these individual risk and protective factors for adolescent sexual activity as well as how factors at the mircrosystem and macrosystem levels relate to feelings of invulnerability. The assumptions of a representative sample with a normal distribution and a linear relationship between the variables were met for only the hypothesis that youth reporting supportive communities will have lower levels of invulnerability, however, so a Spearman's r*ho* was used for the remaining hypotheses (e.g. hypotheses # 11, # 18, # 22, # 23, and # 27).

Hypotheses with variables that were not measured using an interval scale were also tested using a Spearman's r*ho* (i.e. # 10, # 17, # 19, #24, # 25, and # 26) while those hypotheses that had nominal level variable were tested using an independent samples t test for equality of means. (Hypotheses # 12, # 13, # 14, # 15, # 16, # 20, and # 21.)

Protection of Human Subjects

Human Subject approval was sought and obtained from MSU and Wedgwood. Subject confidentiality was maintained and no individual subjects were identified in the findings. Parental/guardian and participant consent were obtained for minors; participant consent only was obtained for those 18 and 19 years of age. (See Appendix B and C for copies of parental and participant consent forms.)

Limitations of the Study

In looking at the relationship between feelings of invulnerability and sexual activity a limitation of this study is that it cannot establish causality. A longitudinal study would better look at the relationship between perceived invulnerability as a predictor of subsequent sexual activity. If a relationship is found, future longitudinal studies could be designed that would be better able to determine if youth who feel invulnerable to the potential negative consequences of sexual activity are more likely to become sexually active.

Another limitation of the study is the use of a convenience sample. While it is hoped that the sample will include youth from a variety of socio-economic and racial groups, it is unlikely that the sample will end up with a proportion of youth from these various groups that is similar to that of society. A concern also exists that youth who are involved in COACH and Wedgwood programs may be somehow different than youth who do not participate, and thus would not be included in the sample. Even within the pool of potential participants from COACH and Wedgwood programs, those who agree to participate and whose parents give permission may also be different than those who do not want to participate or whose parents do not give permission either because they are difficult to reach or simply do not want their child to fill out the survey.

Chapter 4

Results

Surveys

Signed consent forms for 75 youth were returned and 70 youth filled out surveys. (Five of the youth were absent the day the surveys were completed.) Of the 70 surveys filled out by youth, 3 of them had two or more pages incomplete so were excluded from the analysis resulting in 67 usable surveys.

Descriptive Statistics

Sixty-five point seven percent (44) females and 34.3% (23) males completed usable surveys. Age of participants varied from 12 to 19. (See Table 1.) Results for race/ethnicity are found in Table 2.

Table 1- Youth Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	12 or younger	6	9.0	9.0	9.0
	13	7	10.4	10.4	19.4
	14	11	16.4	16.4	35.8
	15	11	16.4	16.4	52.2
	16	6	9.0	9.0	61.2
	17	9	13.4	13.4	74.6
	18	15	22.4	22.4	97.0
	19 or older	2	3.0	3.0	100.0
	Total	67	100.0	100.0	

Table 2- Youth Race/ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Black/African-American	4	6.0	6.0	6.0
	Hispanic	6	9.0	9.0	14.9
	White (not Hispanic)	49	73.1	73.1	88.1
	Mixed race	8	11.9	11.9	100.0
	Total	67	100.0	100.0	

Average grades for respondents varied from getting mostly As to getting mostly Ds. (See Table 3.) Most youth lived in the Grand Rapids metropolitan area. (See Table 4.). The majority of youth lived with two parents with living with mom and step dad the second most common response. (See Table 5.)

Table 3- Average Grades

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mostly As	18	26.9	26.9	26.9
	About half As & half Bs	13	19.4	19.4	46.3
	Mostly Bs	9	13.4	13.4	59.7
	About half Bs & half Cs	12	17.9	17.9	77.6
	Mostly Cs	9	13.4	13.4	91.0
	About half Cs & half Ds	4	6.0	6.0	97.0
	Mostly Ds	1	1.5	1.5	98.5
	Mostly below D	1	1.5	1.5	100.0
	Total	67	100.0	100.0	

Table 4- Where Youth Live

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Grand Rapids metro	38	56.7	56.7	56.7
	Smaller city (Rockford, Lowell, Walker...)	25	37.3	37.3	94.0
	Small town or village (Kent City, Cedar Springs, Sparta)	3	4.5	4.5	98.5
	In country not on farm	1	1.5	1.5	100.0
	Total	67	100.0	100.0	

Table 5- With Whom Youth Lives

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Two parents	34	50.7	50.7	50.7
	Mom and step dad	12	17.9	17.9	68.7
	Dad and step mom	1	1.5	1.5	70.1
	Mom only	10	14.9	14.9	85.1
	Dad only	4	6.0	6.0	91.0
	Group or foster home	3	4.5	4.5	95.5
	Other relative	1	1.5	1.5	97.0
	Alone or with friends	2	3.0	3.0	100.0
	Total	67	100.0	100.0	

The majority of moms had at least a high school education (see Table 6) as did the majority for dads (see Table 7). Table 8 shows results for if parents had ever divorced or separated.

Table 6- Mom's Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Professional/graduate degree	7	10.4	11.3	11.3
	Some school beyond 4 year college	5	7.5	8.1	19.4
	Graduated from 4 yr college	11	16.4	17.7	37.1
	Graduated from a 2-year college or technical school	2	3.0	3.2	40.3
	Some college or technical school	13	19.4	21.0	61.3
	High school	20	29.9	32.3	93.5
	Elementary or junior high school	4	6.0	6.5	100.0
	Total	62	92.5	100.0	
Missing	Don't know	5	7.5		
Total		67	100.0		

Table 7- Dad's Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Professional/graduate degree	3	4.5	5.0	5.0
	Some school beyond 4 year college	7	10.4	11.7	16.7
	Graduated from 4 yr college	6	9.0	10.0	26.7
	Graduated from a 2-year college or technical school	3	4.5	5.0	31.7
	Some college or technical school	11	16.4	18.3	50.0
	High school	24	35.8	40.0	90.0
	Elementary or junior high school	6	9.0	10.0	100.0
	Total	60	89.6	100.0	
Missing	Don't know	7	10.4		
Total		67	100.0		

Table 8- Parents Divorced or Separated

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never divorced or separated	31	46.3	47.7	47.7
	Never married	16	23.9	24.6	72.3
	Divorced/separated more than 1 year	18	26.9	27.7	100.0
	Total	65	97.0	100.0	
Missing	Missing	2	3.0		
Total		67	100.0		

Most youth were non-smokers. (See Table 9.) The majority of youth did not drink at all. (See Table 10.) Most denied having five or more drinks at one time in the last month. (See Table 11.) Fewer youth reported marijuana use than alcohol use. (See Table 12.) Even less youth admitted to using other drugs. (See Table 13.)

Table 9- Youth Smoking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	44	65.7	67.7	67.7
	Once or twice	3	4.5	4.6	72.3
	1 to 3 times a month	1	1.5	1.5	73.8
	Daily	17	25.4	26.2	100.0
	Total	65	97.0	100.0	
Missing	Missing	2	3.0		
Total		67	100.0		

Table 10- Youth Drinking

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	34	50.7	51.5	51.5
	Once or twice	16	23.9	24.2	75.8
	1 to 3 times a month	10	14.9	15.2	90.9
	1-3 times a week	5	7.5	7.6	98.5
	4-6 times a week	1	1.5	1.5	100.0
	Total	66	98.5	100.0	
Missing	Missing	1	1.5		
Total		67	100.0		

Table 11- More than Five Drinks in the Last Month

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	50	74.6	75.8	75.8
	Yes, once	6	9.0	9.1	84.8
	Yes, twice	3	4.5	4.5	89.4
	Yes, 3-5 times	5	7.5	7.6	97.0
	Yes, 10 or more times	2	3.0	3.0	100.0
	Total	66	98.5	100.0	
Missing	Missing	1	1.5		
Total		67	100.0		

Table 12- Youth Marijuana Use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	43	64.2	65.2	65.2
	Once or twice	11	16.4	16.7	81.8
	1 to 3 times a month	2	3.0	3.0	84.8
	1-3 times a week	4	6.0	6.1	90.9
	4-6 times a week	3	4.5	4.5	95.5
	Daily	3	4.5	4.5	100.0
	Total	66	98.5	100.0	
Missing	Missing	1	1.5		
Total		67	100.0		

Table 13- Youth Use of Other Drugs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not at all	59	88.1	89.4	89.4
	Once or twice	3	4.5	4.5	93.9
	1 to 3 times a month	4	6.0	6.1	100.0
	Total	66	98.5	100.0	
Missing	Missing	1	1.5		
Total		67	100.0		

The majority of youth strongly disagreed that they would not get pregnant (or get a partner pregnant) with unprotected sex. (See Table 14.) The majority of youth also strongly disagreed that they would not get a sexually transmitted disease (STD) from unprotected sex. (See Table 15.) When asked in the reverse later in the questionnaire a larger majority strongly agreed that they could get pregnant with unprotected sex. (See Table 16). More youth also strongly agreed that they could get an STD with unprotected sex. (See Table 17.)

Table 14- Youth Don't Fear Pregnancy with Unprotected Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	34	50.7	50.7	50.7
	Disagree	7	10.4	10.4	61.2
	Not sure	5	7.5	7.5	68.7
	Agree	5	7.5	7.5	76.1
	Strongly agree	16	23.9	23.9	100.0
	Total	67	100.0	100.0	

Table 15- Youth Don't Fear STDs with Unprotected Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	39	58.2	58.2	58.2
	Disagree	6	9.0	9.0	67.2
	Not sure	4	6.0	6.0	73.1
	Agree	2	3.0	3.0	76.1
	Strongly agree	16	23.9	23.9	100.0
	Total	67	100.0	100.0	

Table 16- Youth Think They Could Get Pregnant with Unprotected Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	52	77.6	77.6	77.6
	Agree	10	14.9	14.9	92.5
	Not sure	2	3.0	3.0	95.5
	Strongly disagree	3	4.5	4.5	100.0
	Total	67	100.0	100.0	

Table 17- If Youth Think They Could Get an STD with Unprotected Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	50	74.6	74.6	74.6
	Agree	11	16.4	16.4	91.0
	Not sure	2	3.0	3.0	94.0
	Strongly disagree	4	6.0	6.0	100.0
	Total	67	100.0	100.0	

Over half of the youth disagreed or strongly disagreed that their religion/religious beliefs were important to them (see Table 18) while about 34% agreed or strongly agreed that they were not very involved with religious activities (see Table 19).

Table 18- Religion Important

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	33	49.3	50.8	50.8
	Disagree	12	17.9	18.5	69.2
	Not sure	14	20.9	21.5	90.8
	Agree	3	4.5	4.6	95.4
	Strongly agree	3	4.5	4.6	100.0
	Total	65	97.0	100.0	
Missing	no response	2	3.0		
Total		67	100.0		

Table 19- Not Very Involved in Religious Activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly disagree	22	32.8	33.8	33.8
	Disagree	11	16.4	16.9	50.8
	Not sure	9	13.4	13.8	64.6
	Agree	13	19.4	20.0	84.6
	Strongly agree	10	14.9	15.4	100.0
	Total	65	97.0	100.0	
Missing	No response	2	3.0		
Total		67	100.0		

When asking if youth had ever had sex how old they were the first time, over half stated that they had not yet had sex. (See Table 20.) In addition to those youth who had never had sex, many who had, had not had sex in the last 3 months. (See Table 21.) For number of life time partners the same number (56.7%, 38) reporting that they had never had sex reported no sexual partners. (See Table 22.) See Table 23 for youth report of frequency of sex when drunk. Sixty-one (91%) had never been diagnosed with an STD while the remaining six (9%) had been diagnosed within the last year. Table 23 shows results for birth control. The majority of youth (88.1%, 59) had not been pregnant or gotten someone pregnant while 9% (6) had within the last year, and 3% (2) had more than a year ago.

Table 20- If Ever Had Sex Age 1st Voluntary Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never had sex	38	56.7	56.7	56.7
	19 years old	1	1.5	1.5	58.2
	17 years old	4	6.0	6.0	64.2
	16 years old	5	7.5	7.5	71.6
	15 years old	9	13.4	13.4	85.1
	14 years old	8	11.9	11.9	97.0
	13 years old	1	1.5	1.5	98.5
	12 years old	1	1.5	1.5	100.0
	Total	67	100.0	100.0	

Table 21- How Often Youth Had Sex in the Last Three Months

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Have not had sex in the last 3 months	43	64.2	64.2	64.2
	1 time	6	9.0	9.0	73.1
	2 times	2	3.0	3.0	76.1
	3 times	3	4.5	4.5	80.6
	4 times	1	1.5	1.5	82.1
	5 times	2	3.0	3.0	85.1
	6 or more times	10	14.9	14.9	100.0
	Total	67	100.0	100.0	

Table- 22 Number Lifetime Partners

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No sexual partners	38	56.7	57.6	57.6
	1 partner	8	11.9	12.1	69.7
	2 partners	4	6.0	6.1	75.8
	3 partners	7	10.4	10.6	86.4
	4 partners	5	7.5	7.6	93.9
	5 partners	2	3.0	3.0	97.0
	6 or more partners	2	3.0	3.0	100.0
	Total	66	98.5	100.0	
Missing	System	1	1.5		
Total		67	100.0		

Table 23- How Often Youth Have Sex When Drunk

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never had sex	39	58.2	58.2	58.2
	Never sex when drunk	15	22.4	22.4	80.6
	Rarely sex when drunk	4	6.0	6.0	86.6
	Sometimes sex when drunk	7	10.4	10.4	97.0
	Most of the time	2	3.0	3.0	100.0
	Total	67	100.0	100.0	

Table 24- How Often Youth Use Birth Control

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never had sex	39	58.2	58.2	58.2
	Always	17	25.4	25.4	83.6
	Most of the time	4	6.0	6.0	89.6
	About half the time	1	1.5	1.5	91.0
	Sometimes	2	3.0	3.0	94.0
	Rarely	1	1.5	1.5	95.5
	Never	3	4.5	4.5	100.0
	Total	67	100.0	100.0	

No youth were currently being sexually abused, though 6 (9%) admitted to sexual abuse that had stopped, 60 (89.6%) stated they had never been sexually abused, and 1 (1.5%) did not answer the question. The majority of youth (51, 76.1%) had never been physically abused though 14 (20.9%) said they had been, but the abuse had stopped and 2 did not respond to the question. Thirty (44.8%) had never witnessed abuse while the remainder had in various settings. (See Table 25.)

Table 25- Witnessed Abuse or Beating

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	30	44.8	44.8	44.8
	Yes in home	7	10.4	10.4	55.2
	Yes in school	5	7.5	7.5	62.7
	Yes in town	9	13.4	13.4	76.1
	Yes in home and school	2	3.0	3.0	79.1
	Yes in school and town	7	10.4	10.4	89.6
	Yes in home and town	2	3.0	3.0	92.5
	Yes in all three places	5	7.5	7.5	100.0
	Total	67	100.0	100.0	

When asked about their community, most strongly agreed or agreed that there were neighbors who could help them with a problem. (See Table 26.) Results for if adults in the community would tell parents if youth did something wrong are found in Table 27 while Table 28 shows youth beliefs that people in their community know and care about each other.

Table 26- Neighbors Could Help with a Problem

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	26	38.8	38.8	38.8
	Agree	22	32.8	32.8	71.6
	Disagree	10	14.9	14.9	86.6
	Strongly disagree	9	13.4	13.4	100.0
	Total	67	100.0	100.0	

Table 27-Community Adult Would Tell Parent if Youth Did Something Wrong

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	22	32.8	32.8	32.8
	Agree	27	40.3	40.3	73.1
	Disagree	8	11.9	11.9	85.1
	Strongly disagree	10	14.9	14.9	100.0
	Total	67	100.0	100.0	

Table 28- People in the Community Know and Care about Each Other

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	13	19.4	19.4	19.4
	Agree	33	49.3	49.3	68.7
	Disagree	11	16.4	16.4	85.1
	Strongly disagree	10	14.9	14.9	100.0
	Total	67	100.0	100.0	

Most youth very often or always told an adult they lived with before going out. (See Table 29.) The majority also very often or always talked about their plans with friends with an adult in their home. (See Table 30.) Adults in the home very often or always asked where most youth were going. (See Table 31.) When asked if

adults in their home usually knew what youth were doing after school most youth stated they very often or always knew. (See Table 32.)

Table 29- Youth Tell Adults Before Going Out

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often/always	41	61.2	61.2	61.2
	Often	9	13.4	13.4	74.6
	Sometimes	7	10.4	10.4	85.1
	Rarely	5	7.5	7.5	92.5
	Never	5	7.5	7.5	100.0
	Total	67	100.0	100.0	

Table 30- Youth Talk with Adults about Plans

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often/always	39	58.2	58.2	58.2
	Often	12	17.9	17.9	76.1
	Sometimes	6	9.0	9.0	85.1
	Rarely	6	9.0	9.0	94.0
	Never	4	6.0	6.0	100.0
	Total	67	100.0	100.0	

Table 31- Adults Ask When Youth Go Out

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often/always	42	62.7	64.6	64.6
	Often	11	16.4	16.9	81.5
	Sometimes	5	7.5	7.7	89.2
	Rarely	4	6.0	6.2	95.4
	Never	3	4.5	4.6	100.0
	Total	65	97.0	100.0	
Missing	No adults at home	2	3.0		
Total		67	100.0		

Table 32- Adult Knows What Youth Do after School

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often/always	42	62.7	64.6	64.6
	Often	12	17.9	18.5	83.1
	Sometimes	4	6.0	6.2	89.2
	Rarely	3	4.5	4.6	93.8
	Never	4	6.0	6.2	100.0
	Total	65	97.0	100.0	
Missing	No adults at home	2	3.0		
Total		67	100.0		

The majority of youth stated that their parents were there when they needed them. (See Table 33.) Even more felt their parents cared about them. (See Table 34.)

Table 33- Parent There When Needed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often/always	43	64.2	64.2	64.2
	Often	13	19.4	19.4	83.6
	Sometimes	2	3.0	3.0	86.6
	Rarely	5	7.5	7.5	94.0
	Never	4	6.0	6.0	100.0
	Total	67	100.0	100.0	

Table 34- Parent Cares About Youth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very often/always	56	83.6	83.6	83.6
	Often	5	7.5	7.5	91.0
	Sometimes	2	3.0	3.0	94.0
	Never	4	6.0	6.0	100.0
	Total	67	100.0	100.0	

Most youth strongly agreed that their parents think it is wrong for teens their age to have sex. (See Table 35.). While still the majority, fewer strongly agreed that their parents think it is wrong for teens their age to drink alcohol. (See Table 36.)

Table 35- Parents Say Teens Should Not Have Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	42	62.7	62.7	62.7
	Agree	9	13.4	13.4	76.1
	Not sure	10	14.9	14.9	91.0
	Disagree	2	3.0	3.0	94.0
	Strongly disagree	4	6.0	6.0	100.0
	Total	67	100.0	100.0	

Table 36- Parents Say Teens Should Not Drink

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	39	58.2	58.2	58.2
	Agree	11	16.4	16.4	74.6
	Not sure	10	14.9	14.9	89.6
	Disagree	2	3.0	3.0	92.5
	Strongly disagree	5	7.5	7.5	100.0
	Total	67	100.0	100.0	

Table 37 shows if youth felt their friends help them stay out of trouble. Table 38 gives results if most of their friends do not have sexual intercourse. The majority of youth reported that most of their friends do not drink or do drugs. (See Table 39.) Most youth reported that most of their friends do not smoke. (See Table 40.)

Table 37- Youth Friends Help Them Stay Out of Trouble

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	20	29.9	30.3	30.3
	Agree	32	47.8	48.5	78.8
	Disagree	10	14.9	15.2	93.9
	Strongly disagree	4	6.0	6.1	100.0
	Total	66	98.5	100.0	
Missing	No response	1	1.5		
Total		67	100.0		

Table 38- Most Friends Do Not Have Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	21	31.3	31.3	31.3
	Agree	14	20.9	20.9	52.2
	Disagree	15	22.4	22.4	74.6
	Strongly disagree	17	25.4	25.4	100.0
	Total	67	100.0	100.0	

Table 39- Most Friends Do Not Drink of Do Drugs

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	22	32.8	32.8	32.8
	Agree	14	20.9	20.9	53.7
	Disagree	13	19.4	19.4	73.1
	Strongly disagree	18	26.9	26.9	100.0
	Total	67	100.0	100.0	

Table 40- Most Friends Do Not Smoke

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	29	43.3	43.3	43.3
	Agree	10	14.9	14.9	58.2
	Disagree	14	20.9	20.9	79.1
	Strongly disagree	14	20.9	20.9	100.0
	Total	67	100.0	100.0	

Youth were also asked their personal belief about if teenagers should not be having sexual intercourse. Table 41 shows their responses.

Table 41- Youth Belief That Teens Should Not Have Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	28	41.8	42.4	42.4
	Agree	14	20.9	21.2	63.6
	Disagree	16	23.9	24.2	87.9
	Strongly disagree	8	11.9	12.1	100.0
	Total	66	98.5	100.0	
Missing	No response	1	1.5		
Total		67	100.0		

Correlation between Feelings of Invulnerability and Sexual Activity

Using a Spearman's r*ho*, the correlation coefficient for the first hypotheses that youth with higher perceived invulnerability will be more likely to be sexually active was not significant ($\alpha = .07$) with an r of -.19 when looking just at sexual vulnerability nor was it ($\alpha = .12$) with an r of -.14 when looking just at the personal fable scale. With the low reliability of the sexual vulnerability scale, but the strong correlation of the first two questions with each other and the second two questions with each other, the hypothesis was also tested with just the first two sexual vulnerability questions resulting in a significant though weak negative correlation ($r = -.26$, $\alpha = .02$) and again using just the second two sexual vulnerability questions showing no significant relationship ($r = -.08$, $\alpha = .26$). This weak negative correlation indicates that youth with higher perceived invulnerability are actually less likely to be sexually active.

Using the same test the second hypothesis that youth with higher perceived invulnerability will have greater frequency of sexual activity was not significant either ($\alpha = .07$) with an r of -.18 for sexual vulnerability nor when looking at the

personal fable scale (r = -.12, α = .16). When run with just the first two sexual vulnerability questions there was a significant though weak negative correlation (r = -.24, α = .03) indicating that youth with higher perceived invulnerability actually have less frequency of sexual activity, but using just the second two sexual vulnerability questions no significant relationship was found (r = -.08, α = .26).

The third hypothesis that youth with higher perceived invulnerability will have a greater number of lifetime partners remained insignificant with an r of -.15 (α = .11) for sexual vulnerability and an r of -.09 (α = .24) for the personal fable scale. When run with just the first two sexual vulnerability questions there was a significant though weak negative correlation (r = -.24, α = .03) indicating that youth with higher perceived invulnerability had fewer number of lifetime partners, but using just the second two sexual vulnerability questions no significant relationship was found (r = -.05, α = .33).

The fourth hypothesis that youth with higher perceived invulnerability will more frequently have sex while drunk or high was significant (α = .034) using the Spearman's *rho* showing a small negative correlation of -.23 for sexual vulnerability indicating that youth with higher perceived invulnerability have sex while drunk less frequently, but was not significant (α = .15) with an r of -.13 for the personal fable scale. When run with just the first two sexual vulnerability questions there was a significant though weak negative correlation (r = -.26, α = .02) again indicating less frequent sex while drunk for those with higher perceived invulnerability, but using just the second two sexual vulnerability questions no significant relationship was found (r = -.10, α = .20).

For the fifth hypotheses that youth with higher perceived invulnerability will have greater use of birth control the results were not significant with an *r* of -.16 (α = .10) for sexual vulnerability and an *r* of -.13 (α = .15) for the personal fable scale. When run with just the first two sexual vulnerability questions there was a significant though weak negative correlation (*r* = -.24, α = .03) indicating that youth with higher perceived invulnerability have less use of birth control, but using just the second two sexual vulnerability questions no significant relationship was found (*r* = -.04, α = .39).

Due to the low reliability of the personal fable scale a factor analysis was done. Based on the factor analysis the five items with the highest loading on the first factor were chosen from the original 14 item scale. These components included questions 51, 53, 57, 59, and 60. (See Appendix A). When the first hypotheses that youth with higher perceived invulnerability will be more likely to be sexually active was tested using this new five item scale, the results were still not significant with an alpha of .12 and an *r* of .15. The results remained insignificant for the hypothesis that youth with higher levels of invulnerability would more frequently have sex (*r* = .19, α = .11), have greater number of lifetime partners (*r* = .14, α = .12), would have greater use of birth control (*r* = .09, α = .24), and be more likely to have sex when drunk or high (*r* = .14, α = .13).

Using an independent samples t test for the hypotheses that youth who have ever had an STD will have lower levels of perceived invulnerability, for sexual vulnerability those without a history of an STD had a mean score of 3.33 compared to those with no history who averaged 3.56 indicating no significant difference (α = .90)

with a t value of .13 with 6.11 degrees of freedom (df). Using just the first two sexual vulnerability questions those with a history an STD had a mean score of 1.67 while those with no history had a mean score of 2.79 indicating no significant difference (α = .38) with a t value of .94 with 6.51 df. Using just the second two sexual vulnerability questions those with a history an STD had a mean score of 1.67 while those with no history had a mean score of .77 indicating no significant difference (α = .53) with a t value of -.68 with 5.27 df. General vulnerability scores varied from an average of 29 for those with a history of STD to 25.82 for those without but the difference was still not statistically significant (α = .068) with a t of –2.06 and 9.27 df. When looking at only the five items with the highest loading form the personal fable scale, the invulnerability score mean was 12.67 for those with a history of STD compared to 10.54 for those without, remaining insignificant with an alpha of .25, a t of –1.29 and 5.29 df.

Using the same test to look at the hypothesis that youth who have ever been or had ever gotten someone pregnant will have lower levels of perceived invulnerability, sexual vulnerability scores averaged 2.13 for those who had been or had gotten someone pregnant while those who had never been or gotten someone pregnant averaged 3.7, though the difference was not significant (α = .31, t = 1.1, and df = 9.31). Using just the first two sexual vulnerability questions showed a mean of 2.80 for those who had never been or gotten someone pregnant compared to 1.88 for those who had (α = .50, t = 71, and df = 8.70) while using the second two sexual vulnerability questions resulted in a mean of .93 for those with no history of pregnancy and .25 for those who did have a history of pregnancy (α = .07, t = 1.92,

and df = 25.34). For general invulnerability the mean was 26.13 for those who had been or had gotten someone pregnant compared to 26.1 for the rest which indicated no significant difference ($\alpha = .99$, t = -.01, and df = 12.73). The five factors with the highest loading from the personal fable scale mean for those with a history of pregnancy was 10.88 compared to 10.71 for those without a history still indicating no significant difference ($\alpha = .88$, t = -.16, and df = 11.21).

Before testing the hypothesis that youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled, Spearman's *rho* correlations were run on these variables to make sure that they were in fact correlated to sexual activity in this population. Average grades was significantly correlated to sexual activity with an r of .53 ($\alpha < .01$), as was parental approval of teen sex ($r = .51$, $\alpha < .01$), and parental approval of teen drinking ($r = .29$, $\alpha = .02$). Other significant results included peer group ($r = .47$, $\alpha < .01$), drug use ($r = .60$, $\alpha < .01$), religion ($r = .32$, $\alpha = .01$), youth's belief that teens shouldn't have sex ($r = .62$, $\alpha < .01$), parents education ($r = .48$, $\alpha < .01$), parental support ($r = .38$, $\alpha < .01$), supportive community ($r = .23$, $\alpha = .03$), and parental monitoring ($r = .36$, $\alpha < .01$), all indicating higher likelihood of sexual activity for youth with high risk behavior. For nominal level variables Chi-square tests were performed. Looking at with whom youth live the results were also significant (value 18.39 with 7 degrees of freedom and an alpha of .01) as they were for if parents were divorced (value 10.53, df = 2, $\alpha < .01$), if youth had witnessed abuse (value 12.00, df = 1, $\alpha < .01$), and if youth had been physically abused (value 14.40, df = 1, $\alpha < .01$) all indicating greater likelihood of sexual activity for youth with risk factors while if youth had been sexually abused

was not significantly correlated to sexual activity (value .16 with 1 degree of freedom and an alpha of .70).

Due to the relatively small sample size of 67 surveys only the four highest scaled variable predictors of sexual activity were included in the initial logistic regression to test the hypothesis that youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled. Using teens' belief that teens should not have sex, drug use, GPA, and parents' approval of teen sex along with sexual vulnerability teens belief that teens should not have sex and GPA were significant while the other variables were not. (See Table 42.) The model Chi-square indicated a good fit with a value or 47.6 with 5 degrees of freedom and a significance level of < .01. Using the same four variables but this time with only the first two sexual vulnerability questions, teens belief that teens should not have sex and GPA remained significant while the other variables were not with a model Chi-square indicating a good fit with a value or 47.47 with 5 degrees of freedom and a significance level of < .01. (See Table 43.) Again using the same four variable but with the second two sexual vulnerability questions, belief that teens should not have sex and GPA were still significant while the other variables remained insignificant. The model Chi-square indicated a good fit with a value or 46.71 with 5 degrees of freedom and a significance level of < .01. (See Table 44.)

Table 42- Logistic Regression of Sexual Vulnerability and Top 4 Correlates

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	I believe teens should not have sex	1.087	.450	5.824	1	.016	2.966
	Drug use by teen	.167	.109	2.363	1	.124	1.182
	GPA	.629	.296	4.502	1	.034	1.875
	My parents think teen sex is wrong	.697	.394	3.140	1	.076	2.008
	Sexual vulnerability (all 4 questions)	-.130	.128	1.035	1	.309	.878
	Constant	-3.553	1.077	10.875	1	.001	.029

a Variable(s) entered on step 1: teennosex, druguse, gpa, parnosex, sexvuln.

Table 43- Logistic Regression of 1st Two Sexual Vulnerability Questions and Top 4 Correlates

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	I believe teens should not have sex	1.052	.454	5.379	1	.020	2.863
	Drug use by teen	.171	.107	2.538	1	.111	1.186
	GPA	.606	.295	4.232	1	.040	1.833
	My parents think teen sex is wrong	.724	.399	3.282	1	.070	2.062
	Sexual vulnerability (1st questions)	-.143	.148	.936	1	.333	.867
	Constant	-3.542	1.083	10.698	1	.001	.029

a Variable(s) entered on step 1: teennosex, druguse, gpa, parnosex, sexvul1nd2.

Table 44- Logistic Regression of 2nd Two Sexual Vulnerability Questions and Top 4 Correlates

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	I believe teens should not have sex	1.140	.446	6.531	1	.011	3.127
	Drug use by teen	.197	.108	3.316	1	.069	1.217
	GPA	.627	.289	4.706	1	.030	1.871
	My parents think teen sex is wrong	.594	.374	2.520	1	.112	1.811
	Sexual vulnerability (2nd questions)	-.139	.284	.239	1	.625	.870
	Constant	-3.958	1.070	13.695	1	.000	.019

a Variable(s) entered on step 1: teennosex, druguse, gpa, parnosex, sexvul3and4.

When the same four variables were used with the personal fable scale teens belief that teens should not have sex and GPA remained significant and drug use also was significant. (See Table 45.) With 5 degrees of freedom the goodness if fit for a model Chi-square was significant with the alpha < .01 and a value of 47.96. When run with the five items with the highest loading from the personal fable scale, teen belief that teens should not have sex and GPA were the only significant factors. The

goodness of fit was significant with an alpha of < .01, a model Chi-square value of 46.56, and 5 df. (See Table 46.)

Table 45- Logistic Regression of Personal Fable and Top 4 Correlates

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	I believe teens should not have sex	1.144	.437	6.861	1	.009	3.138
	Drug use by teen	.216	.106	4.176	1	.041	1.241
	GPA	.649	.289	5.040	1	.025	1.914
	My parents think teen sex is wrong	.614	.370	2.755	1	.097	1.849
	General vulnerability scale	-.091	.077	1.401	1	.237	.913
	Constant	-1.880	1.973	.908	1	.341	.153

a Variable(s) entered on step 1: teennosex, druguse, gpa, parnosex, genvulnerability.

Table 46- Logistic Regression of 5 Items with the Highest Loading on the Personal Fable Scale and Top 4 Correlates

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	I believe teens should not have sex	1.128	.445	6.430	1	.011	3.089
	Drug use by teen	.198	.109	3.270	1	.071	1.218
	GPA	.594	.283	4.422	1	.035	1.812
	My parents think teen sex is wrong	.630	.373	2.853	1	.091	1.878
	Five highest loading vulnerability questions	.039	.141	.077	1	.782	1.040
	Constant	-4.401	1.800	5.982	1	.014	.012

a Variable(s) entered on step 1: teennosex, druguse, gpa, parnosex, topfactrovul.

Further testing the hypothesis that youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled the top four nominal level variables converted to dichotomous variables were used. These included not living with both biological parents, parents having been divorced or separated, witnessing abuse, and having a history of abuse. Again using logistic regression with these four dichotomous variables and sexual vulnerability living with both biologic or adoptive parents and witnessing abuse were significant while the other components were not. (See Table 47.) With 5 degrees of freedom the goodness if fit for a model Chi-square was significant with the alpha of < .01 and a value of 18.49. Rerunning the model with only the first two sexual

vulnerability questions living with both biologic or adoptive parents and witnessing abuse were significant while the other components were not (see Table 48) with 5 degrees of freedom the goodness if fit for a model Chi-square was significant with the alpha of < .01 and a value of 18.47. Next using only the second two sexual vulnerability questions only witnessing abuse remained significant (see Table 49) with 5 degrees of freedom the goodness if fit for a model Chi-square was significant with the alpha of < .01 and a value of 18.06.

Table 47- Logistic Regression with Top 4 Dichotomous Variables and Sexual Vulnerability

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Lives with two parents	1.215	.615	3.899	1	.048	3.370
	Parents ever divorced or separated	.030	.156	.036	1	.849	1.030
	Has witnessed abuse, yes or no	1.384	.632	4.804	1	.028	3.992
	Has ever been abused, yes or no	-.052	.198	.070	1	.791	.949
	Sexual vulnerability (4 questions scale)	-.061	.075	.656	1	.418	.941
	Constant	-1.525	.627	5.927	1	.015	.218

a Variable(s) entered on step 1: live2parents, everdivorce, witnessabusedic, everabusedic, sexvuln.

Table 48- Logistic Regression with Top 4 Dichotomous Variables and 1st Two Sexual Vulnerability Questions

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Lives with two parents	1.266	.616	4.218	1	.040	3.547
	Parents ever divorced or separated	.018	.157	.013	1	.908	1.018
	Has witnessed abuse, yes or no	1.315	.652	4.064	1	.044	3.725
	Has ever been abused, yes or no	-.050	.196	.066	1	.798	.951
	Sexual vulnerability (1st questions)	-.080	.100	.651	1	.420	.923
	Constant	-1.507	.637	5.590	1	.018	.222

a Variable(s) entered on step 1: live2parents, everdivorce, witnessabusedic, everabusedic, sexvul1nd2.

Table 49- Logistic Regression with Top 4 Dichotomous Variables and 2nd Two Sexual Vulnerability Questions

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Lives with two parents	1.183	.622	3.614	1	.057	3.265
	Parents ever divorced or separated	.048	.160	.089	1	.765	1.049
	Has witnessed abuse, yes or no	1.539	.619	6.172	1	.013	4.660
	Has ever been abused, yes or no	-.064	.198	.105	1	.746	.938
	Sexual vulnerability (questions 3and4)	-.080	.163	.243	1	.622	.923
	Constant	-1.747	.548	10.161	1	.001	.174

a Variable(s) entered on step 1: live2parents, everdivorce, witnessabusedic, everabusedic, sexvul3and4.

Using the same four dichotomous variables with the personal fable scale living with both biologic parents and witnessing abuse remained significant while no other components were significant. (See Table 50). The model Chi-square was significant ($\alpha < .01$) with a value of 19.42 and 5 df. Using the same four variables with the five items with the highest loading from the personal fable scale showed that only witnessing abuse was significant. (See Table 51.) The goodness of fit for this model was significant ($\alpha < .01$) with a Chi-square value of 17.87 with 5 df.

Table 50- Logistic Regression with Top 4 Dichotomous Variables and Personal Fable Scale

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Lives with two parents	1.435	.646	4.935	1	.026	4.200
	Parents ever divorced or separated	.071	.163	.190	1	.663	1.074
	Has witnessed abuse, yes or no	1.410	.622	5.141	1	.023	4.097
	Has ever been abused, yes or no	-.051	.199	.065	1	.799	.951
	General vulnerability scale	-.065	.052	1.556	1	.212	.937
	Constant	-.182	1.377	.017	1	.895	.834

a Variable(s) entered on step 1: live2parents, everdivorce, witnessabusedic, everabusedic, genvulnerability.

Table 51- Logistic Regression with Top 4 Dichotomous Variables and 5 Items with the Highest Loading on the Personal Fable Scale

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Lives with two parents	1.208	.630	3.675	1	.055	3.347
	Parents ever divorced or separated	.038	.160	.057	1	.811	1.039
	Has witnessed abuse, yes or no	1.503	.613	6.001	1	.014	4.493
	Has ever been abused, yes or no	-.071	.197	.131	1	.718	.931
	Five highest loading vulnerability questions	.020	.083	.056	1	.813	1.020
	Constant	-2.016	.979	4.244	1	.039	.133

a Variable(s) entered on step 1: live2parents, everdivorce, witnessabusedic, everabusedic, topfactrovul.

In order to address the hypothesis that perceived invulnerability will have less impact on the sexual behavior of youth with few risk factors and more protective factors while having a greater impact on those with multiple risk factors and fewer protective factors, the scaled variables were changed to dichotomous variables. Due to the varying metrics across scales, this was necessary to prevent unequal weighting for risk and protective factors.

For GPA, youth with average grades (i.e. half Bs and half Cs and better) were classified as low risk while those getting mostly Cs or below were classified as being high risk based on Lammers, Ireland, Resnick, and Blum's (2000) findings that youth with above average school performance were lower risk than those with average or below school performance. Looking at family structure, the literature supports (Mullan, Duncan, & Boisjoly, 2002; Talashek, Norr & Dancy, 2003) that living with both biological parents vs. with one biological parent and a step parent, a single parent, or any other arrangement is a protective factor as well as having parents who have never been divorced or separated.

While little in the literature specified how much parental education would be protective for youth, Kirby, Coyle, and Gould (2001) used the term "college

education" when looking at how overall community education impacted risk taking behaviors in youth. With this in mind, a combined parental education score of seven or lower (indicating on average that parents had some college or technical school or had graduated from a 2-year college or technical school) was considered protective while a combined score of eight or higher (indicating less parental education) was considered a risk factor.

Changing drug use to a dichotomous variable was more challenging as even low frequency use of harder drugs may be higher risk than higher frequency use of a substance such as tobacco. With this in mind a youth, on average, smoking or using a tobacco product three times a month or less (score of 2 or less), having had alcohol twice or less ever (score of 1 or less), having never had marijuana (score of 0) or other drugs (score of 0), and not having had more than four alcoholic drinks at one time in the last month (score of 0) would be considered low risk with total drug scores of three or less while scores of four and above would be considered a high risk.

For importance of religion/religious beliefs and religious activities youth with combined scores of zero to one on the two item scale were considered low risk while those with scores of two or higher were considered high risk. For history of sexual abuse, physical abuse and witnessing physical abuse not having a history or witnessing abuse was low risk while having been or witnessed abuse was high risk for each of the three variables.

For the caring community scale scores of four and under were re-coded as low risk meaning youth on average agreed with at least two of the three statements of community caring while scores of five and above were considered high risk. Scores

of four and below on the parental monitoring scale indicating parents were often aware of their youth's activity for an average of at least three of the questions while on average sometimes being aware for the remaining question were considered protective. Scores of four or higher indicating less parental monitoring, were considered a risk. On the parental support scale scores of three or less showing that youth felt parents were often or very often there and cared about them indicated low risk while scores of four and above indicated high risk.

Looking at the parental approval of teen sexual activity and alcohol use each of these zero to four scores convert to zero for low risk strongly agreeing or agreeing while one, high risk, would be represented by scores of two to four ranging from not sure to strongly disagreeing. For peer group, combined scores of five and under indicate low risk with generally agreeing that their friends help them stay out of trouble and do not engage in risky behaviors while scores of 6 and above would indicate at least some high risk behaviors in their friends. Lastly, for youth belief that teens should not be having sex youth agreeing or strongly agreeing (0 or 1) were coded as low risk (0) while youth disagreeing or strongly disagreeing (2 or 3) were coded as high risk (1).

All 16 of these risk factors were totaled for a possible score of 0 to 16. To test the hypothesis that perceived invulnerability will have less impact on the sexual behavior of youth with few risk factors and more protective factors while having a greater impact on those with multiple risk factors and fewer protective factors a logistic regression was done entering total risk together with perceived vulnerability to look for an interaction between these two variables and sexual activity. This test

was first run with sexual vulnerability. The results were not significant (see Table 52) and the model Chi-square indicated a poor goodness of fit with a value of 1.51 with 1 df and an alpha of .22. When run with just the first two sexual vulnerability questions the results remained insignificant (see Table 53) with the model Chi-square indicating a poor goodness of fit with a value of .42 with 1 df and an alpha of .56. Then run with just the second two sexual vulnerability questions the results remained insignificant (see Table 54) with the model Chi-square indicating a poor goodness of fit with a value of 2.03 with 1 df and an alpha of .15. General vulnerability based on the personal fable scale was run next. Results from this test were significant as was the goodness of fit with the model Chi-square value of 22.08 with 1 df and an alpha of < .01 indicating support for they hypothesis. (See Table 55.) When running the test with the five items with the highest loading from the personal vulnerability scale the results were also significant, again supporting the hypothesis (see Table 56) with the model Chi-square indicating a good fit with a value of 21.42, 1 df and an alpha of <.01.

Table 52- Logistic Regression with Total Risk and Sexual Vulnerability

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Total risk factors by sexual vulnerability	.017	.014	1.405	1	.236	1.017
	Constant	-.499	.340	2.150	1	.143	.607

a Variable(s) entered on step 1: riskfactorstotaldic * sexvuln .

Table 53- Logistic Regression with Total Risk and 1st Two Sexual Vulnerability Questions

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Total risk factors by 1st sexual vulnerability questions	.012	.018	.418	1	.518	1.012
	Constant	-.397	.336	1.398	1	.237	.673

a Variable(s) entered on step 1: riskfactorstotaldic * sexvul1nd2 .

Table 54- Logistic Regression with Total Risk and 2nd Two Sexual Vulnerability Questions

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Total risk factors by 2nd sexual vulnerability questions	.049	.050	.982	1	.322	1.050
	Constant	-.414	.307	1.816	1	.178	.661

a Variable(s) entered on step 1: riskfactorstotaldic * sexvul3and4 .

Table 55- Logistic Regression with Total Risk and Personal Fable Scale

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	General vulnerability scale by total risk factors	.018	.005	12.779	1	.000	1.018
	Constant	-2.573	.740	12.103	1	.001	.076

a Variable(s) entered on step 1: genvulnerability * riskfactorstotaldic .

Table 56- Logistic Regression with Total Risk and 5 Items with the Highest Loading on the Personal Fable Scale

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1(a)	Total risk factors by five highest loading vulnerability questions	.040	.011	12.053	1	.001	1.040
	Constant	-2.349	.686	11.720	1	.001	.095

a Variable(s) entered on step 1: riskfactorstotaldic * topfactrovul .

Correlation of Factors Impacting Sexual Activity and Feelings of Invulnerability

Testing for the following hypothesis were all done using a Spearman's *rho* as the samples were not normally distributed or were not interval level variables. For the hypothesis that younger youth will have higher levels of invulnerability using the personal fable scale the r of -.05 was not significant ($\alpha = .35$) nor was it when looking just at feelings of invulnerability to the potential consequences of sexual activity ($\alpha = .09$) with an r of -.21. It remained insignificant ($r = -.18$, $\alpha = .07$) when run with just the first two sexual vulnerability questions but was significant using the second two sexual vulnerability questions ($r = -.26$, $\alpha = .02$). Running this correlation with the adjusted five items with the highest loading from the of the personal fable scale from

the factor analysis, the results were also significant with an *r* of .21 and an alpha of .05.

The *r* of <.01 was not significant ($\alpha = .49$) for the hypothesis that youth who use alcohol or drugs will have higher levels of invulnerably but was ($\alpha = .01$, $r = -.28$) when looking just at sexual vulnerability indicating a negative correlation between alcohol or drug use and feelings of invulnerability. When looking at just the first two sexual vulnerability questions the negative relationship was a little stronger ($r = -.32$, $\alpha < .01$) but was not significant using just the second two questions ($r = -.06$, $\alpha = .31$). Then using the five items with the highest loading from the personal fable scale the results were again significant, this time with a positive correlation of .21 and an alpha of .05.

For the hypothesis that youth with strong religious beliefs will have lower levels of invulnerability using the personal fable scale the *r* was .03 with an $\alpha = .40$ and remained insignificant even when just looking at sexual vulnerability ($\alpha = .28$, $r = .07$), just the first two sexual vulnerability questions ($r = .02$, $\alpha = .42$), just the second two sexual vulnerability questions ($r = .20$, $\alpha = .051$), as well as the five items with the highest loading from the personal fable scale ($r = .10$, $\alpha = .21$).

For the hypothesis that youth with higher levels of parental monitoring will have lower levels of invulnerability looking at the personal fable scale the *r* was .09 ($\alpha = .23$) and remained insignificant even when just looking at sexual vulnerability ($r < .-.01$, $\alpha = .49$), just the first two sexual vulnerability questions ($r = .04$, $\alpha = .37$), just the second two sexual vulnerability questions ($r = -.04$, $\alpha = .39$), and the five items with the highest loading from the personal fable scale ($\alpha = .21$, $r = .10$).

An insignificant *r* value of .05 (α = .36) was obtained for the hypothesis that youth with higher levels of parental support will have lower levels of invulnerability using the personal fable scale as it was for sexual invulnerability (*r* = .-.18, α = .07), just the first two sexual vulnerability questions (*r* = -.12, α = .17), just the second two sexual vulnerability questions (*r* = -.15, α = .12), and the five items with the highest loading from the personal fable scale (*r* = .12, α = .16).

Using the personal fable scale an *r* of -.05 (α = .34) resulted for the hypothesis that youth who report having friends who get into trouble, are sexually active, drink or use drugs, or smoke will have lower levels of perceived invulnerability. Using sexual invulnerability the results remained insignificant (α = .06) with an *r* of .-.20 but a weak negative significant relationship was found using just the first two sexual vulnerability questions (*r* = -.21, α = .05), but was not using just the second two sexual vulnerability questions (*r* = -.15, α = .11), while the five items with the highest loading from the personal fable scale resulted in an insignificant *r* of .16 and an alpha of .10.

The hypothesis that youth reporting supportive communities will have lower levels of invulnerability was tested using the Pearson Product Moment Correlation as the results were fairly normally distributed. The results were not significant when using the personal fable scale with an *r* of .08 (α =.26). Looking at sexual vulnerability resulted in an *r* of -.14 and an alpha of .13, using just the first two sexual vulnerability questions resulted in an *r* of -.18 and an alpha of .08, using just the second two sexual vulnerability questions resulted in an *r* of -.01 and an alpha of

.46, while the five items with the highest loading from the personal fable scale had an *r* of .12 and an alpha of .18.

Using a Spearman's *rho* for the hypothesis that youth with higher GPAs will have lower levels of invulnerability the correlation coefficient of $r = .01$ was not significant ($\alpha = .46$). Looking at sexual vulnerability the $r = -.06$ was not significant either ($\alpha = .33$) nor was it for just the first two sexual vulnerability questions with an *r* of -.11 with an alpha of .20 or just the second two sexual vulnerability questions ($r = .46$, $\alpha = .39$). It was, though, for the five items with the highest loading from the personal fable scale ($r = .20$, $\alpha = .01$).

Using the personal fable scale, the Spearman's r*ho r* value of .06 was not significant ($\alpha = .34$) for the hypothesis that youth who have parents with higher levels of education will have lower levels of invulnerability. When using the sexual vulnerability scale the *r* was -.13 with an alpha of .17, using just the first two sexual vulnerability questions the *r* was -.10 with an alpha of .24, using just the second two sexual vulnerability questions the *r* was -.13 with an alpha of .17, and with the five items with the highest loading from the personal fable scale the *r* was significant ($\alpha = .03$) with a weak correlation value of .24.

For the hypothesis that youth with parents that are more approving of adolescent sexual activity will have higher levels of invulnerability, the results indicated an *r* of -.04 ($\alpha = .38$) for the personal fable scale. Using the sexual vulnerability scale resulted in an *r* of .02 with an alpha of .43. Using just the first two sexual vulnerability questions showed an *r* of .06 with an alpha of .33 while just the second two sexual vulnerability questions resulted in an *r* of -.09 and an alpha of .24.

With the five items with the highest loading from the personal fable scale, the results remained insignificant with an *r* of -.11 with an alpha of .19.

When looking at the hypothesis that youth whose parents were more approving of teen drinking will have higher levels of invulnerability using the personal fable scale the *r* was .14 (α = .13). When using the sexual vulnerability scale the *r* was -.11 (α = .18). With just the first two sexual vulnerability questions the *r* was -.10 (α = .45) and using just the second two sexual vulnerability questions the *r* of -.24 was significant (α = .02), but using the five factor scale the *r* of .13 was no longer significant with an alpha of .14.

For the hypothesis that youth who believe that teens should not have sexual intercourse will have lower levels of invulnerability using the personal fable scale the Spearman's *rho* was -.03 which was not significant (α = .39) nor was the *r* of -.08 (α = .25) for the sexual vulnerability scale, just the first two questions of the sexual vulnerability scale (*r* = .09, α = .25), just the second two questions of the sexual vulnerability scale (*r* = .10, α = .22), or the five items with the highest loading from the personal fable scale (*r* = .10, α = .22).

For the hypothesis that youth with a history of sexual abuse will have lower levels of invulnerability, the mean personal fable score was 25.96 for those who had never been abused and 26.93 for those with a history of sexual abuse. An independent samples t test confirmed that there was no significant difference between the means of the two groups with a t of -.58, 24 degrees of freedom (df) and an alpha of .57. Looking at only the sexual vulnerability scale the mean for those never having been sexually abused was 3.6 compared to 3.5 for those who had. The independent samples

t test also confirmed that there was no significant difference between the means with a t of .08, 7.47 degrees of freedom and an alpha of .94, again not supporting the hypothesis. Using only the first two sexual vulnerability questions the mean for those never having been sexually abused was 2.82 compared to 1.83 but a t test again confirmed that there was no significant difference between them with a t of .71, 64 df, and an alpha of .48. Then with just the second two sexual vulnerability questions the mean for those never having been sexually abused was .78 compared to 1.67 for those with a history of sexual abuse with a t test confirming no significant difference with a t of -.67, 5.28 df, and an alpha of .53. When using only the five factor vulnerability scale the mean for those who had been abused was 10.80 compared to 10.83 for the others and again did not support the hypothesis with a t of -.02, 5.7 degrees of freedom and an alpha of .99.

The mean personal fable vulnerability score for youth with a history of physical abuse was 26.93 compared to 25.96 for those without. This did not support the hypothesis that youth who had been abused would have lower levels of invulnerability, with a t of -.58, 23.77 df and an alpha of .57. Looking at sexual vulnerability the mean for those with a history of abuse was 2.64 while it was 3.92 for the rest. The t of 1.13 with 25 degrees of freedom showed an insignificant alpha of .27 also not supporting the hypothesis. Using just the first two sexual vulnerability questions the mean for those who had never been abused was 2.9 compared to 2.29 for those with a history of abuse with a t of .65, 22.06 df, and an insignificant alpha of .52. For the second two sexual vulnerability questions the mean for those with no history of abuse was 1.02 compared to .36 with a t value of 1.18, 63 df, and an

insignificant alpha of .24. The hypothesis was not supported using just the five factor vulnerability scale either, which resulted in means of 10.43 for those with no history of abuse compared to a mean of 11.93 for those with a history and a t value of –1.49, 22.85 degrees of freedom and an alpha of .15.

For the hypothesis that youth who have witnessed physical abuse will have lower levels of invulnerability, when looking just at the personal fable vulnerability scale youth who had witnessed abuse had a mean vulnerability score of 25.57 while those who had not had a mean score of 26.77 for a t of .79 with 60.86 df and was not significant with an alpha of .43. Using the sexual vulnerability scale showed means of 2.49 for those witnessing abuse compared to 4.83 for those not witnessing abuse. The t value of 2.35 with 61 degrees of freedom did support the hypothesis that youth who had witnessed abuse would have lower invulnerability scores with an alpha of .02. Using just the first two sexual vulnerability questions showed a mean of four for those never having witnessed abuse while those who had showed a mean of 1.62. The t value of 3.19 with 65 df was also significant with an alpha of $< .01$. With just the second two sexual vulnerability questions means for those never having witnessed abuse were .83, very close to those never having witnessed abuse at .87 with a t of -.07, 64.54 df, and an alpha of .94. Finally, testing the same hypothesis using the five factor personal fable invulnerability scale the mean for those witnessing abuse was 11.11 while those not witnessing abuse had a mean of 10.27 resulting in an insignificant ($\alpha = .34$) t of -.95 with 63.28 degrees of freedom.

Males had a mean personal fable vulnerability score of 26.78 while females averaged 25.75. For the hypothesis that males will have higher levels of

invulnerability, an independent samples t test resulted in a t of .68 with 37.92 df and was not significant with an alpha of .54. Looking at sexual vulnerability males had a mean score of 5.78 compared to 2.36 for females resulting in a t of 3.02 with 32.37 df and a significant alpha of < .01. With just the first two sexual vulnerability questions the mean for males was 4.61 compared to 1.68 for females resulting in a t of 3.87 with 65 degrees of freedom and an alpha of less than .01. Using just the second two sexual vulnerability questions the mean for males was 1.17 compared to .68 for females with a t of .90, 31.22 df, and an insignificant alpha of .37. Using the five factor personal fable scale showed a mean of 10.74 for males and 10.73 for females with results insignificant ($\alpha = .99$) for a t of .01 with 38.14 df.

The mean personal fable vulnerability score for minority youth was 25.22 while white youth had a mean score of 26.43. The results of the independent samples t test did not support the hypothesis that minority youth will have higher levels of invulnerability, with a t of .75, 33.68 df and an alpha of .46. Looking just at sexual vulnerability the mean for minority youth was 2.67 compared to 3.86 for white youth but the results remained insignificant with an alpha of .27 for a t value of 1.11 with 35.42 df. Using just the first two sexual vulnerability scale questions showed similar results with mean for minority youth 2.92 compared to 2.06 for white youth with a t of .99, 31.84 df, and an alpha of .33. The second two sexual vulnerability questions were also quite close with means of .61 for minority youth and .94 for white youth resulting in a t of .86 with 58.6 df and an alpha of .40. The five factor personal fable scale had similar results with a mean of 3.13 for minority and 3.70 for white youth with a t value of 1.86 with 35.57 df and an alpha of .07.

For the hypothesis that youth who live with both parents will have lower levels of invulnerability the results were not significant. The mean personal fable vulnerability score for those living with both parents was 25.15 with those not living with both parents was 27.09 with the results of the independent samples t test showing a t of -.1.31 with 64.58 df and an alpha of .19. The mean score on the sexual vulnerability scale for youth living with both parents was 4.38 and 2.67 for the others resulting in a t value of 1.7 with 60.29 df with an alpha of .09. Using just the first two sexual vulnerability questions the mean for youth living with both parents was 3.24 compared to 2.12 for those not living with both parents resulting in a t of 1.42, 64.45 df and an alpha of .16. With the second two sexual vulnerability questions the mean for youth living with both parents was 2.11 compared to 1.50 those not living with both parents resulting in a t of 1.35, 59.74 df, and an alpha of .18. The mean for youth living with two parents on the 5 item personal fable scale was 9.76 compared to 11.73 for the others with a t value of –2.29, 60.63 df and a significant alpha of .026 supporting this hypothesis.

The mean personal fable score for youth whose parents had never been divorced or separated was 25.35 while the mean for the rest was 27.09 with the independent samples t-test showing no significant difference with a t of –1.15, 62.73 df and an alpha of .26. Means for youth whose parents had never been divorced or separated on the sexual vulnerability scale was 4.35 compared to 2.76 for the others but was still not significant ($t = 1.52$, $df = 53.56$, and $\alpha = .13$). Using the first two sexual vulnerability questions the mean for those whose parents had never divorced or separated was 3.16 compared to 2.18 for those whose parents had with a t of 1.24,

59.93 df, and an alpha of .22. With the second two sexual vulnerability questions the mean for those whose parents had never divorced or separated was 1.12 compared to .59 for those whose parents had not resulting in a t of 1.31 with 63 df and an alpha of .19. Using the top 5 factors the mean for those whose parents had never divorced or separated was 9.84 with the others at 11.56, but again was not significant ($t = -1.97$, $df = 61.93$, and $\alpha = .05$).

Chapter 5

Discussion of Results

This study used an ecological perspective to help better understand adolescent sexual activity. More specifically, it looked at the little explored individual factor of perceived invulnerability, in relation to risk factors associated with significant contexts of sexual activity and other individual factors.

Youth Demographics

It is helpful to look at how the youth in this study compare to other youth in the area and nation wide. While a convenience sample was used, with some potential self selection bias, in most categories the sample appears to be fairly representative.

One area where the results were somewhat atypical was in regards to gender. Almost twice as many female youth as male youth filled out surveys. It was expected that this convenience sample would have fairly equal numbers of males and females, though it is possible that the Life Skills groups surveyed had a higher percentage of female youth or it could be that the girls were better about taking the consent forms home for parental signatures and remembering to return them on time.

The age span of respondents was not as evenly representative as it could have been either as it was somewhat bimodal with over 30% 14 or 15 and over 30% 17 or 18. (See Table 1.) This distribution was likely due to the large number of Life Skills classes taught to 8^{th} and 9^{th} grade students who are typically 14 or 15 years of age as well as the number of classes taught to 12^{th} grade students who are usually 17 or 18 years of age.

More representatively, nearly three quarters of youth completing surveys were White. This mirrors the national average of 75.1%, is slightly below the Michigan percentage of 80.2 and slightly above the Grand Rapids percentage of 67.3 (US Census, 2000a). Because the majority of youth were from the greater Grand Rapids region this percentage reflects fairly well the overall demographics for the area. Considering that the Life Skills programs try to target high risk youth, it was expected that the sample might include more minority youth, though there are many high risk White youth in the study area as well. White youth also may have had better return rates for their consent forms, though this is purely speculation.

As expected, the majority of youth were from the greater Grand Rapids area where most of the Life Skills groups were held. A few groups were also held in smaller cities and outlying areas in the more rural part of Kent County accounting for the small number of youth living in a small town or in the country.

Aside from the overrepresentation of female youth, overall youth characteristics were fairly representative of youth in the study area and even youth nation wide. While still limited as a convenience sample with potential self-selection bias, this may help some with generalizing to other similar populations.

Relationships between Feelings of Invulnerability and Sexual Activity

When looking at feelings of invulnerability to the consequences of sexual activity, over a quarter of youth felt they would not get pregnant or get a partner pregnant or get an STD with unprotected sex. When the questions were asked with reverse coding later in the survey only around 5% felt strongly that they would not get pregnant or get a partner pregnant or get an STD with unprotected sex. The

variation in the two sets of responses might indicate that the youth did not read the questions very carefully or had difficulty with the reverse coding and may also explain the relatively low Cronbach's alpha of .75 for these four items. A crosstabulation run with each of the two questions that were negatively worded against the same positively worded questions indicated that 13 of the 67 respondents may have misunderstood the question as they gave contradictory responses. Since the correlation between just the first two questions using a Spearman's *rho* was .84 ($\alpha <$ .01) and between the second two questions was .76 ($\alpha <.01$) it was felt best to analyze each hypothesis not only with the full four question sexual vulnerability scale, but each of the two sub-scales in turn as well even though the correlation between the two sub-scales using a Spearman's *rho* was only .36 ($\alpha < .01$).

The low Cronbach's alpha of .56 for the personal fable scale was also of concern. While this personal fable scale was designed specifically to get at the vulnerability piece of the personal fable, some of the questions, for example those about feelings, did not seem to relate as well to the idea of risk taking behaviors. The concern about the low reliability of the scale in this study led to a factor analysis. Using the five items with the highest loading on the first factor from the factor analysis resulted in a Cronbach's alpha of .65 and was used in hypothesis testing, along with the original personal fable scale.

About 43% of the youth had ever had sex. This is slightly lower than the national average of 45.6% for high school students (Dillard, 2002). Since this sample included some younger youth, not yet in high school, this would explain the slightly higher percentage of youth who had not yet had sex.

Fourteen and 15 years of age were the most common responses when youth who were sexually active reported when they first had sex. (See Table 20.) To see how this compared to the actual age of the youth, a cross-tabulation was done. (See Table 57.) While the lower rate of sexual activity in the 16 year olds is surprising, the overall trend that older youth are more likely to be sexually experienced was expected and again reflects national averages (Dillard, 2002).

Table 57- Youth Age and Chronological Age of 1st Sex Cross Tabulation

Count

		Chronological age of 1st sex								Total
		never had sex	12 years old	13 years old	14 years old	15 years old	16 years old	17 years old	18 years old	
youth age	12 or younger	6	0	0	0	0	0	0	0	6
	13	7	0	0	0	0	0	0	0	7
	14	10	0	1	0	0	0	0	0	11
	15	6	1	0	4	0	0	0	0	11
	16	5	0	0	1	0	0	0	0	6
	17	1	0	0	2	3	2	1	0	9
	18	3	0	0	1	6	2	2	1	15
	19 or older	0	0	0	0	0	1	1	0	2
Total		38	1	1	8	9	5	4	1	67

From a risk perspective over half of the youth who had reported having had sex were currently sexually active having had sex at least three times in the last three months. Over half of the sexually active youth reported three or more life time partners with the percentage of youth reporting four or more life time partners very close to national averages (Dillard, 2002). Over half of those who reported having had sex had never had sex while drunk and only about 21% of sexually active youth had ever been diagnosed with an STD. Almost 60% of sexually active youth reported consistent use of birth control and nearly 30% had been or had gotten their partner

pregnant. Considering the high risk nature of the study population, these results are not surprising.

Youth with higher perceived invulnerability will be more likely to be sexually active.

This hypothesis was not supported. The only significant relationship found was a weak negative correlation with sexual activity and feelings of sexual vulnerability using only the first two, negatively worded and reverse coded, vulnerability questions. If youth read the questions correctly and did feel invulnerable to the potential consequences of unprotected sexual activity it appears these youth were less likely to have been sexually active. Conversely, youth who felt more vulnerable were more likely to have had sex. It is unclear if the sample size was too small to pick up any other significant relationships or if no other relationships exist. It is possible that, while feelings of invulnerability might contribute to adolescent sexual activity as postulated, once an adolescent has engaged in sexual activity feelings of invulnerability may decrease as the youth might better realize the risks, especially if the youth has experienced any of the potential negative consequences. A longitudinal study that could follow youth from pre adolescence or early adolescence, before they are sexually active, throughout adolescence would be better able to detect any potential relationship to feelings of invulnerability and possible changes over time especially in relation to sexual activity. If, as speculated, youth with higher levels of invulnerability are more likely to engage in sexual activity, following them over time would allow detection of this relationship.

Youth with higher perceived invulnerability will have greater frequency of sexual activity.

This hypothesis was not supported either with the only significant relationship again coming from use of the first two sexual vulnerability scale questions with a weak negative correlation. Similar to the findings of Boyer et al. (2000), this suggests that youth may be able to judge their increased risk with increased sexual activity even though it may not impact behavior, as youth with greater frequency of sex had lower levels of invulnerability than youth with less frequency on this subscale

Youth with higher perceived invulnerability will have a greater number of lifetime partners.

As before, using just the first two sexual vulnerability questions resulted in a weak negative but significant correlation. All of the other vulnerability scales produced even weaker correlations, none of which were significant. If youth answering the negatively worded sexual vulnerability questions did indeed understand the questions correctly, the most likely explanation again supports the findings of Boyer et al. (2000) that youth may well be able to judge risk and that youth who have had more partners may realize their increased vulnerability even if this ability to judge risks and realize vulnerability does not lead them to change their behavior.

Youth with higher perceived invulnerability will more frequently have sex while drunk or high.

Two significant relationships were found between sexual activity and feelings of invulnerability. The correlations between youth levels of perceived invulnerability

to the consequences of sexual activity and frequency of having sex while drunk or high resulted in a small negative correlation that does not support the hypothesis that youth with higher perceived invulnerability will more frequently have sex while drunk or high. Testing again using just the first two sexual vulnerability questions resulted in a slightly stronger, though still weak, negative correlation. Since correlations cannot show causation but only indicate the presence of a relationship, it is possible that youth who engage in sex while drunk or high feel more vulnerable, even though it may not change their behavior. This is similar to findings by Cohen and Bruce (1997) who found no correlation between perceived probability of STD incident and actual behavior in a group of college students as well as results from Williams et al. (2003) showing that female college students were unlikely to take precautions to reduce risk even when they acknowledged having sex with a high risk partner. It may also be that youth who do not engage in sex while drunk or high may feel less vulnerable as previously speculated for number of partners and frequency of sexual activity since they do not engage in this high risk behavior.

Youth with higher perceived invulnerability will have greater use of birth control.

The only significant result found when testing this hypothesis was a weak negative correlation using the first two sexual vulnerability questions. This result, assuming youth read the negatively worded sexual vulnerability questions correctly, would indicate that youth with greater birth control use actually feel somewhat more vulnerable. It seems counterintuitive that youth using birth control would feel more vulnerable than youth not using birth control. Youth not using birth control may not

be sexually active though, and therefore, may feel less vulnerable, even with the questions specifically saying "if I have unprotected sex". Using a Spearman's *rho* a very high correlation of .94 ($\alpha < .01$) was found between birth control use and sexual activity as youth who are not sexually active generally have no need for birth control. Almost 75% of sexually active youth stated they used birth control most of the time or always with only about 14% saying they rarely or never did. Since correlations can not determine cause and effect it may be that the nearly 75% of sexually active youth who are good about using birth control took precautions because they felt more vulnerable to the possible negative consequences of sexual activity. Being able to look at longitudinal data regarding feelings of invulnerability, sexual activity, and birth control use would be very helpful in better determining relationships and even possible causation.

Youth who have ever had an STD will have lower levels of perceived invulnerability.

Looking at youth who had a history of an STD there were no significant differences between their mean invulnerability scores compared to the scores of those who had never had an STD. While it was expected that youth, having had an STD, would have lower levels of invulnerability, it may be that those youth who had a history of an STD may not feel more vulnerable because they may think they are protected if they are using birth control. Using a Spearman's *rho* to look for a correlation between history of STD and birth control use (with many forms also offering some protection against STDs) there was a significant relationship with an *r* of .35 and an alpha of <.01. This provides some support for the explanation that these

youth may think that the use of protection may offer a small measure of safety against STDs.

Youth who have ever been pregnant or gotten someone pregnant will have lower levels of perceived invulnerability.

Youth who had been or had ever gotten anyone pregnant had mean invulnerability scores that were not significantly different than those who had not. Similar to youth with a history of an STD, however, the relationship between history of pregnancy and birth control use was significant ($\alpha < .01$) with an r of .36 also providing support for why these youth may not have had decreased feelings of invulnerability.

Youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled.

Spearman *Rho* correlations for scaled predictors of sexual activity and sexual activity in youth were all significant with r values ranging from .29 for parental approval of teen drinking to .62 for youth's belief that teens should not have sex. These correlations reflect previous studies (Beal, Ausiello, & Perrin, 2001; Blum & Rinehard, 1997; Kalil & Kunz, 1999; Kirby, 2002a; Luster & Small, 1994; Perkins et al., 1998; and Wu et al., 2003) showing how risk factors relate to sexual activity in youth.

Testing the hypothesis that youth with higher perceived invulnerability will be more likely to be sexually active when other predictors of sexual activity are controlled was difficult due to the small sample size. For this reason number of variables in the logistic regression was limited to five. The top four variables, as

determined by correlation to sexual activity, were used with each of the vulnerability scales in turn. The hypothesis was not supported. It may be that the small sample size prohibited detection of a relationship, or it may be that feelings of invulnerability are not correlated to sexual activity as speculated.

As some of the risk factors were nominal level data, chi-square tests were performed to look for a difference in sexual activity for youth with and without these risk factors. Nominal level risk factors associated with sexual activity included not living with both parents, if parents were ever divorced or separated, if youth had witnessed abuse, and if youth had been physically abused as indicated in previous studies (Kirby, 2002a; Mulan et al., 2002; Perkins et al., 1998; and Talashek et al., 2003). History of sexual abuse was not significantly correlated to sexual activity in this population even through it was found to be correlated with sexual activity in other studies (Kirby, 2002a; Perkins et al., 1998). The small percentage (9%) of youth who had been sexually abused may have made it harder to detect a relationship in this study.

When the four significant nominal level variables and sexual activity were entered into a logistic regression with each of the vulnerability scales in turn, the hypothesis that youth with higher perceived invulnerability would be more likely to be sexually active when other predictors of sexual activity were controlled was still not supported.

Perceived invulnerability will have less impact on the sexual behavior of youth with few risk factors and more protective factors while having a greater impact on those with multiple risk factors and fewer protective factors.

To test the hypothesis that perceived invulnerability will have less impact on the sexual behavior of youth with few risk factors and more protective factors while having a greater impact on those with multiple risk factors and fewer protective factors each of the scaled variables was changed to a dichotomous variable in order to calculate a total risk score without unequal weighting of any of the variables. When the calculated risk scores were entered into a logistic regression with the sexual invulnerability scale as well as the two separate sexual vulnerability subscales the results were not significant.

When the total risk scores were entered into the model with the personal fable scale as well as the five items with the highest loading on the first factor, the results for both were significant. These support the hypothesis indicating that feelings of invulnerability have a greater impact on the sexual activity of youth with more risk factors and fewer protective factors. So, while the study was unable to find a relationship between feelings of invulnerability and sexual activity when controlling for the most highly correlated risk factors for sexual activity, it was able to detect a relationship between feelings of invulnerability and sexual activity when controlling these factors in youth with higher levels of risk. The small, but significant, impact of feelings of invulnerability on higher risk youth lends supports to the work of Hammen (2003) who felt that high risk youth could be impacted more by protective factors than lower risk youth. In this case, though, high risk youth were impacted

more by feelings of invulnerability than low risk youth. Sameroff, Gutman, and Peck (2003) suggest that protective factors have less impact on lower risk youth while having greater impact on higher risk youth emphasizing the constellation of risk in the lives of youth. This supports using a human ecology framework to help better understand the many influences impacting adolescent sexual activity. The factors associate with adolescent sexual activity found at the individual, microsystem, and macrosystem levels in this study were also noted in previous works (Beal, Ausiello, & Perrin, 2001; Blum & Rinehard, 1997; Kalil & Kunz, 1999; Kirby, 2002a; Luster & Small, 1994; Mulan et al., 2002; Perkins et al., 1998; Talashek et al., 2003; and Wu et al., 2003), while adding the little studied individual factor of perceived invulnerability.

The finding that feelings of invulnerability have a greater impact on the sexual activity of youth with more risk factors and fewer protective factors may be the first to be documented on this topic. Some of the previously documented factors associated with adolescent sexual activity may be impacted by intervention programs. Interventions to help youth by tutoring, to improve school success and grades; interventions to decrease teen drug use; interventions to involve youth in religious activities; and interventions to educate parents to improve parental support and monitoring are all examples that might help decrease risk factors and subsequently decrease adolescent sexual activity. Other factors associated with adolescent sexual activity though, are difficult or impossible to impact with basic intervention programs. Youth programs can't change a youth's history of abuse or the fact that the youth's parents divorced and may or may not be able to change parental and youth

approval for teen sexual activity and drinking. At a macrosystem level, it may be possible to impact cultural and societal norms that contribute to single parent homes, abuse, low educational attainment, and views on the acceptability of adolescent sexual activity and drinking. Changing these cultural and societal norms would require changes in the media and how sexual activity is portrayed. This type of systemic change needs strong grassroots community and/or high level governmental support and possibly even regulation. A combined bottom up and top down approach might be able to overcome some of the many challenges to this type of change.

The possibility for impacting adolescent sexual activity by decreasing the risk factors found in this and previous studies needs further exploration. The added finding that feelings of invulnerability in youth with high levels of measured risk also impacts adolescent sexual activity is a new finding that need further substantiation. While other risk factors associated with adolescent sexual activity have been well documented, the literature contains little on feelings of invulnerability and how these feelings relate to sexual activity. Knowing that, in this sample, a correlation was found between feelings of invulnerability and high risk youth, this concept needs further study. If feelings of invulnerability are found to correlate to adolescent sexual activity in other samples, interventions to help counter these feelings, such as interactive computer games or virtual reality simulations (Knoppers, 2003a) might be helpful and should be investigated further.

Relationship between Factors Impacting Sexual Activity and Feelings of Invulnerability

Younger youth will have higher levels of invulnerability.

The literature suggests that younger youth have higher levels of invulnerability (Buis & Thompson, 1989; Greene, Kromar, & Walters, 2000; Lapsley, 1990; and Vartanian, 2000). There was no significant correlation between age and any of the invulnerability scales except the second two sexual vulnerability questions which showed a weak negative correlation and the five items with the highest loading on the first factor which showed a weak positive correlation. So, for those two positively worded sexual vulnerability questions younger youth felt slightly more vulnerable than older youth supporting the thought that some younger youth had low levels of invulnerability while some older youth had high levels. Younger youth attending Life Skills classes may have realized greater levels of vulnerability to the consequences of sexual activity through course content yet still demonstrated slightly greater feelings of general invulnerability. Older youth, may have participated in high risk sexual behaviors and not experienced any negative outcomes buoying their feelings of invulnerability just on that scale.

Youth who use alcohol or drugs will have higher levels of invulnerability.

It was also hypothesized that youth who use alcohol or drugs would have higher levels of invulnerability. Drug use included tobacco, alcohol, marijuana, and other drugs. The majority of youth in this sample were non-smokers though over a quarter of them smoked daily. While disappointing that so many youth smoke, the percentage is not at all unexpected and fairly reflective of rates of smoking reported

by Burns and Johnston (1999). Similarly reported rates of youth drinking and drug use were about what was expected, as Life Skills groups target higher risk youth.

Even with a fairly representative sample, when testing this hypothesis using the personal fable scale no significant relationship was found. When testing with the sexual vulnerability scale there was a weak negative correlation. The correlation was a little stronger, though still weak for the first two sexual vulnerability questions but was no longer found to be significant for the second two sexual vulnerability questions alone. This negative correlation suggests that youth who use alcohol or drugs may actually realize these behaviors may put them at risk for the negative consequences of sexual activity resulting in lower reported levels of invulnerability on this scale. This unexpected finding may relate to program content in Life Skills courses that emphasize the potential negative consequences of sexual activity and the relationship to alcohol or drug use.

Interestingly enough, using the five items with the highest loading on the personal fable scale resulted in a small significant positive relationship suggesting that youth who use alcohol or drugs do have slightly higher levels of general invulnerability when looking only at the more sensitive top five personal fable scale questions. This supports the basic premise of the personal fable, that youth do not think the risks, such as those involved in drinking or drug use, apply to them (Greene, Rubin, & Kromar, 2002). The correlation between alcohol and drug use and the more sensitive personal fable scale affirms the view of egocentric adolescents not believing anything bad could happen to them in a general sense (Buis & Thompson, 1989) while the negative correlation with the sexual vulnerability scale and the one subscale

shows that, at least in this population, youth can perceive some risks. This ability of youth to perceive at least some risk, in this case related to the negative consequences of sexual activity, indicates that interventions to decrease feelings of invulnerability might be useful.

Youth with a history of sexual abuse will have lower levels of invulnerability.

Looking at the hypothesis that youth with a history of sexual abuse would have lower levels of invulnerability there was no significant difference using any of the vulnerability scales. Few of the youth surveyed reported a history of sexual abuse so detecting a relationship with the small number of subjects in the category may have been difficult. A larger sample size with proportionately more youth with a history of abuse might allow detection of a relationship, if one exists. Trying to get a more inclusive sample might also help as it is possible, for whatever reason, that youth with a history of sexual abuse may have been less likely to return signed consent forms to participate in the survey.

Youth with a history of physical abuse will have lower levels of invulnerability.

The results for history of physical abuse for this population are lower than a study reported by Straus and Runyan (1997) and lower than expected rates if use of corporal punishment in this age group is considered abusive but higher than rates reported to Child Protective Service agencies (Straus & Runyan, 1997). Similar to sexual abuse, youth who had a history of physical abuse were not significantly different in levels of invulnerability compared to those with out a history of abuse.

Youth who have witnessed physical abuse will have lower levels of invulnerability.

Over 55% of youth surveyed had witnessed physical abuse. The high percentage of youth who had witnessed abuse likely reflects the communities where these youth live. For the hypothesis that youth who had witnessed physical abuse would have lower levels of invulnerability there was no significant difference using the personal fable scale or the five items with the highest loading on the first factor but there was using the sexual vulnerability scale and the first two sexual vulnerability questions subscale. It is unclear why witnessing abuse would allow youth to realize their vulnerability to the consequences of sexual activity but not impact their general feelings of invulnerability. It is possible that feelings of vulnerability resulting from witnessing abuse were more readily translated into the more concrete feelings of vulnerability to the negative consequences of sexual activity verses the more abstract general feelings of vulnerability measured by the personal fable scale and the more sensitive five item scale. Significant results for only one of the scales may also reflect having a small sample size that can detect some but not all relationships. Additional research with larger sample sizes is needed to see if relationships could be detected for general vulnerability as well.

Males will have higher levels of invulnerability.

Similarly males did not vary significantly from females for feelings of invulnerability as measured by the personal fable scale and the five items with the highest loading on the first factor but did with the sexual vulnerability scale and the first two sexual vulnerability questions subscale. So, males felt less vulnerable to the

consequences of sexual activity than females, but did not vary significantly from females for general feelings of invulnerability. The higher levels of feelings of invulnerability to the consequences of sexual activity are not surprising when considering that adolescent males tend to be high in sensation seeking behaviors, which include sexual activity (Green, Kromar, & Walters, 2000) while, generally feeling somewhat immune to the potential negative consequences. Further research into this relationship is needed as interventions to help counter these feelings of invulnerability may be useful. The ability to pick up a difference in feelings of invulnerability using the sexual vulnerability scale and one of the two subscales but not the personal fable scales may also be related to having a small sample size, especially considering that about half as many males completed surveys as females. Additional studies with larger sample sizes are needed to see if a difference could be detected between males and females.

Minority youth will have higher levels of invulnerability.

Minority youth did not vary significantly in their levels of vulnerability on any of the vulnerability scales as compared to White youth. While the sample included approximately 75% White youth, mirroring the national average (US Census, 2000a) the higher risk nature of these white youth make it more difficult to generalize these findings to other populations. The lack of any significant difference between White and minority youth in this study may reflect that the entire study population was considered somewhat high risk while differences between minority and White youth may often reflect risks levels verses actual race. Also, since only about 25% of the

sample was minority and the overall sample size was small, a relationship may exist, but could not be detected.

Youth with higher GPAs will have lower levels of invulnerability.

For the hypothesis that youth with higher GPAs would have lower levels of invulnerability no significant relationship was found using the personal fable scale or the sexual vulnerability scale. The five items with the highest loading personal fable scale showed a weak relationship with an r of .20 and an alpha of <.01. The top five factors may do a better job of getting at the vulnerability part of the personal fable scale than the full 14 question scale, allowing the relationship to be detected even with the smaller sample size. Donnelly, Eburne, and Eadie (1999) believe that educating students about risks to help overcome perceived invulnerability can impact behavior. A surprising result in the sample population was the high level of reported grades, with over one quarter stating they got mostly As and over half getting mostly Bs or greater. (See Table 3.) This may reflect some self-selection bias as stronger students may be more responsible in following through to gain parental consent and return consent forms. It is possible that this larger number of youth with higher GPAs picked up better on general societal messages about risk and vulnerability. It is unclear, however, why youth with better grades did not feel more vulnerable to the consequences of sexual activity. Even so, educating students about risks may help decrease feelings of invulnerability and may even impact behavior.

Youth with strong religious beliefs will have lower levels of invulnerability.

Youth with strong religious beliefs did not demonstrate lower levels of invulnerability using any of the vulnerability scales. While it was thought that more

religious youth who typically engage in sexual activity at later ages than youth who are less religious would feel more vulnerable, it was not the case in this sample. Only about 10% of youth reported that their religion was important to them while nearly 35% said they were very involved in religious activities. (See Tables 18 and 19.) At first this may seem somewhat contradictory and there is the possibility that youth did not read the questions carefully as one of them was reverse coded. It may, however, just reflect that while youth can be involved in many religious activities they may view them as just that, activities, without feeling that the religious aspect of the activity is important. This could reflect parental encouragement of certain activities that the youth may not view with the same level of religious importance or may also simply reflect that religious groups in the study area offer many activities as a means of outreach to youth who may not be fully committed to that faith. While religiosity does correlate to sexual activity, it was not one of the stronger correlations and so may not have demonstrated a strong enough relationship to be detected with the sample size, especially considering the small percentage of youth that reported that religion was important to them.

Youth who believe that teens should not have sexual intercourse will have lower levels of invulnerability.

Nearly 70% of youth felt teenagers should not be having sexual intercourse even though only about 57% had never engage in sexual intercourse themselves. So, some sexually experienced youth still thought that teenagers should not be having sex. While it was hoped that youth would answer honestly, it is possible that they responded how they thought they should, not necessarily how they actually felt. This

may also be reflective of their regrets over having had sex, their sense of being special and that it was all right for them to have sex but not other teens, or may be related to the Life Skills programs most attended that promote abstinence.

When testing the hypothesis that youth who believe teenagers should not be having sexual intercourse would have higher levels of vulnerability no significant difference was found between vulnerability levels of the youth who felt that teenagers should not be having sex and those who thought it was all right. Since so many youth felt that teens shouldn't be having sex it may have made it more difficult to pick up a difference between them and the youth who thought it was all right considering the small sample size.

Youth who live with both parents will have lower levels of invulnerability.

Most youth lived with two parents while living with mom and step dad or mom only were the second and third most common response. (See Table 5.) Fewer two parent homes might have been expected considering the high risk nature of the sample though results closely mirror Kent County demographics (US Census, 2000b) and these youth may have been better about returning signed consent forms.

For the hypothesis that youth who live with both parents would have lower levels of invulnerability the results were not significant using the personal fable scale or the sexual vulnerability scale or subscale but were using the top five factor scale. These results show that youth who live with both parents had lower levels of invulnerability for the five items with the highest loading on the first factor though no significant difference was detected using the other scales. A larger sample size might have detected relationships using the other scales as well.

The lower invulnerability levels using the more sensitive top five factor scale for youth living with both parents support much past research showing the benefits of two parent households (Cooksey, Mott, & Neubauer, 2002; Lamers, Ireland, Resnick, & Blum, 2000; and Miller, 2002). To see if living with both parents in this sample of youth related to factors found to be protective against adolescent sexual activity found in previous studies, Spearman's *rho* correlations were run. Results showed a significant ($\alpha < .01$) *r* of .53 for average grades, an *r* of .46 with an alpha less than .01 for drug use, an *r* of .41 with an alpha less than .01 for witnessing abuse, an *r* of .33 with an alpha of .01 for parents education, an *r* of .36 with an alpha of less than .01 for parent monitoring, an *r* of .30 with an alpha of .01 for parental support, an *r* of .29 with an alpha of .01 for religion, and an *r* of .26 with an alpha of .02 for peer group. In this sample, percentage of youth living with two parents was similar to US Census (2000b) data and while it is unclear if this population mirrored national averages in other categories the positive correlations with other risk factors offer some support for the protection afforded to youth living with both parents.

While youth programs can try to support parents so that youth can continue to enjoy the benefits of living with both parents, there is little youth workers can do about this risk factor for the many youth already living in single parent homes. Interventions to encourage both parents to build strong relationships to each other during pregnancy and throughout the child's developmental years may also be helpful but would require much more intensive programming and possibly years before seeing any potential benefit, especially in the area of adolescent health. Working to change the culture of our society to encourage stable two parent homes for the benefit

of our youth and future society might be possible through grassroots community work as well as policy changes at all levels of government.

Youth whose parents have never been divorced or separated will have lower levels of invulnerability.

When looking at youth whose parents had never been divorced or separated there was no significant difference in vulnerability scores using any of the scales. Again, a larger sample size may have been able to detect a difference especially considering the very high correlation between youth living with two parents and those with a history of divorce or separation. Using a Spearman's *rho* resulted in an *r* of .88 with an alpha less than .01 showing these two factors to be highly correlated, as expected.

Youth with higher levels of parental monitoring will have lower levels of invulnerability.

Overall most youth reported fairly strong parental monitoring indicating parental involvement in the lives of these youth. For a high risk population this may seem unexpected, though some self selection bias may be reflected here as youth with more supportive parental relationships may have been more motivated and had more encouragement from parents to return their signed consent forms.

Youth with higher levels of parental monitoring were hypothesized to have lower levels of invulnerability but no significant relationship was found for any of the scales. While a larger sample size might have been able to detect a weaker relationship it may also be true that levels of parental monitoring do not impact youth feelings of invulnerability at all.

Youth with higher levels of parental support will have lower levels of invulnerability.

Most youth surveyed also reported fairly strong parental support. Similar to parental monitoring, having supportive parents was not related to lower levels of invulnerability for any of the scales. This may indicate that parental influence does not impact youth perceptions of invulnerability or it may be the relationship was too weak to detect with this sample size.

Youth who have parents with higher levels of education will have lower levels of invulnerability.

Only a small percentage of parents had not completed at least high school. (See Tables 6 and 7.) The largest percentage were marked for high school education, though many parents also had at least some college. This may again reflect some self selection bias if youth whose parents were more highly education were more likely to return signed consent forms.

There was no significant relationship detected for youth who had parents with higher levels of educations using the personal fable scale or any of the sexual vulnerability scales but, similar to youth with higher GPAs, there was using the five items with the highest loading on the first factor ($r = .24$, $\alpha = .03$). This, as suspected for youth with higher GPAs, may reflect the greater sensitivity of the five factor scale but remains unclear as to why these youth would not feel more vulnerable to the consequences of sexual activity. Reasons why youth whose parents had higher levels of education might have lower levels of vulnerability may be similar to those for youth with higher GPAs. To look for a correlation between youth average grades and

parental education a Spearman's *rho* was run resulting in an *r* of .57 and an alpha of .01 showing a moderately strong correlation. Youth whose parents had higher levels of education were more likely to get better grades. This may reflect some degree of inherited intelligence as some level of intelligence is generally needed to complete higher levels of education or could be more related to the environmental impact parents who value education have on their children's grade attainment. Youth in both categories, those whose parents had higher levels of education and those with better grades, were more likely to have lower levels of invulnerability on the more sensitive five factors personal fable scale. It is possible, considering the slightly stronger correlation for youth whose parents have higher levels of education as compared to youth with higher grades, that more highly educated parents are instructing their children more about potential risks that might impact their feelings of invulnerability. Since correlations cannot prove causality, further investigation of these relationships is needed. Better understanding of why youth whose parents are more highly educated have lower levels of invulnerability might lead to interventions to help lower feelings of invulnerability in all youth.

Youth with parents who are more approving of adolescent sexual activity will have higher levels of invulnerability.

Over 75% of youth agreed or strongly agreed that their parents think it is wrong for teens their age to have sex, still leaving close to 25% that weren't sure or disagreed. In working with high risk populations it might be expected that there would be less parental disapproval for adolescent sexual activity, though even parents who may have engaged in sexual activity as adolescents might still not want their

children to do so. It is also possible, again, that more youth whose parents disapproved of adolescent sexual activity returned their signed consent forms.

It was hypothesized that youth with parents more approving of adolescent sexual activity would have higher levels of invulnerability, but this was not supported using any of the scales. Just as no significant relationships were found between youth who believe that teens should not have sexual intercourse and any of the vulnerability scales. This suggests that feelings of invulnerability are not impacted by personal beliefs of the youth or their parents or if a relationship exists it was too small to detect with this sample size.

Youth with parents who are more approving of adolescent alcohol consumption will have higher levels of invulnerability.

Fewer youth strongly agreed that their parents think its wrong for teens their age to drink alcohol than those who felt their parents thought it was wrong for adolescents to engage in sexual activity, though the total for strongly agreed and agreed was still close to 75%. It was hypothesized that youth with parents more approving of adolescent drinking would have higher levels of invulnerability, but this was not supported using any of the scales except the second two sexual vulnerability questions subscale which showed a weak negative correlation. It is unclear why youth whose parents are more approving of adolescent alcohol consumption would have lower levels of invulnerability to the consequences of sexual activity but not general feelings of invulnerability. There was a .41 correlation ($\alpha < .01$) between adolescent drinking and parents approval of adolescent drinking which may help explain the similar results for each of these groups.

Youth who report having friends who get into trouble, are sexually active, drink or use drugs, or smoke will have higher levels of invulnerability.

Similar percentages of youth (over 75%) agreed or strongly agreed that their friends helped them stay out of trouble though only a little over half agreed or strongly agreed that their friends do not have sexual intercourse and do not drink or do drugs with a slightly higher percent (58%) agreeing that their friends don't smoke. This reflects a fairly positive peer group for general behavior and a rather mixed group for sexual activity, drinking, doing drugs, and smoking which fits expectations for the study population.

The hypothesis that youth with a more negative peer group will have higher levels of invulnerability was not supported, though, with the only significant relationship a weak negative correlation using just the first two sexual vulnerability questions. This negative correlation suggests that youth with friends that are more likely to get into trouble, be sexually active, drink, use drugs, or smoke actually have slightly lower levels of invulnerability to the potential consequences of sexual activity. While believed the impact of a negative peer group on these youth would buoy feelings of invulnerability, the opposite may actually be true. Youth with peers who are more likely to get in trouble, drink or do drugs, or have sex may actually realize they are more at risk.

Youth reporting supportive communities will have lower levels of invulnerability.

When looking at the hypothesis that youth reporting supportive communities will have lower levels of invulnerability there was no significant correlation for any

of the scales. Approximately 70% of youth felt that there were neighbors who could help them with a problem, that adults in the community would probably tell their parents if they were doing something wrong, and that people in their community know and care about each other. This suggests a fairly supportive community, yet, considering that over half of youth had observed abuse, might indicate that youth live in high risk areas but with caring neighbors.

Conclusion

Limitations.

A major limitation of this study was the sample size. While large enough to detect moderate and some weaker correlations it may not have been large enough to detect all of the relationships that may have been present and it was too small to fully test those hypotheses requiring logistic regression. Additional research with larger sample sizes is needed to further explore the concept of invulnerability as it relates to sexual activity.

Another limitation was that, as a cross sectional study, it could not demonstrate causality. Ideally, longitudinal studies that could track changes in perceived invulnerability through adolescents as it relates to sexual activity should be attempted.

A possible confounding factor in this study was the use of youth who were participating in Life Skills programs. While the intention was to survey youth in the early portion of the program, the difficulty in obtaining the signed consent forms meant that some groups of youth were surveyed in the middle or near the end of the programs. It is unclear if program content affected the way they answered any of the

survey questions. If using youth in similar programs in the future, surveys should be done as close to the beginning of the program as possible.

Another weakness of this study was the poor reliability of the sexual vulnerability scale and the personal fable scale. The scores from these scales were used to test every hypothesis in this study. The poor reliability of the scales makes it difficult to know if unsupported hypotheses are incorrect or simply a result of tools that do not adequately measure the concept of feelings of invulnerability in adolescents.

The sexual vulnerability scale consisted of two negatively worded reverse coded questions placed early in the survey and two positively worded and coded questions placed later in the survey. (See Appendix A.) The two sets of questions each asked if the youth felt they could get pregnant or get an STD with unprotected sex, with only the wording varying between the sets. Perhaps additional questions should have been added to further assess feelings of invulnerability to the consequences of sexual activity. Considering the high percentage of sexually active youth who used birth control, maybe asking youth about feelings of vulnerability in relation to birth control use may have been useful. A sexual vulnerability scale with more questions would have allowed a wider range of responses and might have been more sensitive, especially if the reverse coding was a problem for youth. Before further studies are undertaken, this scale will likely need to be revised and tested to address these concerns. Hopefully a revised scale will result in higher reliability and a better opportunity to truly test feelings of invulnerability to the consequences of sexual activity in youth.

The reliability for the personal fable scale was even lower than that of the sexual vulnerability scale. While the factor analysis allowed hypothesis testing using the five items with the highest loading, further work on the tool is needed. It is unclear why the tool, which had a reliability of .79 for Greene, Kromar, and Walters (2000) had a reliability of only .56 in this sample. When reading through the 14 questions of this scale (see Appendix A) the top five questions (51, 53, 57, 68, and 60) from the factor analysis along with questions 56 and 58 seem to best get at the concept of vulnerability as addressed in this study. Questions 48 and 50 do seem to address risk somewhat while questions 47, 49, 54, and 55 seem to address general feelings without getting at the vulnerability piece very well. While the concept of personal fable and feelings of invulnerability in adolescents has been around for decades, little research has been done and few tools exist to look at how these feelings impact adolescent sexual activity. Modifying this tool or developing a similar tool with a higher level of reliability is needed to allow future research to better measure the concept of feelings of invulnerability in adolescents.

Lastly, the sampling technique used limits generalizability of the study results. In addition to using a convenience sample of youth attending Life Skills programs there was also a potential self-selection bias. While this sample mirrored national averages in the percentage of minority youth and numbers living in two parent households as well as general levels of sexual activity, it is unclear if the youth returning signed consent forms varied significantly from youth who did not and how well this group might represent youth nation wide. Future studies should strive to get larger more representative samples.

Implications for future research, theory, and social policy/interventions.

Overall the findings support a human ecological perspective for understanding factors that impact adolescent sexual activity at the individual, microsystem, and macrosystem levels and support past research regarding correlates of sexual activity in adolescents. Feelings of invulnerability were more likely to impact the sexual behavior of youth with more risk factors. Further research is needed to better understand the interaction between feelings of invulnerability and adolescent behavior, especially as it relates to sexual activity. Considering some of the unexpected results, longitudinal studies might be able to get a sense of causal relationships to better guide interventions. Future studies should continue to assess and attempt to control other factors impacting adolescent sexual activity in order to view feelings of invulnerability in the context of the adolescent's environment.

Research continues to support the ecological perspective to understanding adolescent behavior. Risk factors and the way they interact remain crucial in planning interventions to improve adolescent outcomes. Viewing adolescents in the context of their environment and working to impact various aspects of their environment to decrease risk remains important. The multiple factors impacting adolescent sexual activity found in this and previous studies further support Bronfenbrenner's (1989) premise that adolescents are inextricably embedded in their environment. How the adolescent personal fable and feelings of invulnerability interact within the adolescent environment remains unclear. No simple relationships were found, with results based on feelings of invulnerability to the potential consequences of sexual activity sometimes contradicting those found when testing only general feelings of

invulnerability. This study brings to light a previously uninvestigated area of adolescent development that needs further research

Considering the study findings that general feelings of invulnerability in higher risk youth had a greater impact on sexual activity than for youth with lower levels of invulnerabilty, those working with adolescents should continue to promote protective factors while working to decrease risk factors, focusing on higher risk youth if funding is limited. Understanding that multiple factors impact adolescent behavior helps explain the ability for programs that focus on sexual abstinence and programs that focus on community service to both have positive outcomes for decreasing sexual activity in youth. Public policy needs to continue to support a wide range of programs that take an ecological approach to positive youth development and to decreasing adolescent sexual activity.

Many of the factors that impact adolescent sexual activity are at the individual and microsystem levels. Yet, some of these factors cannot be easily impacted by standard intervention programs. Factors at the macrosystem level and greater societal norms that impact many microsystem factors need broad level system changes. For example, evidence supports the benefit of two parent households for youth (Cooksey, Mott, & Neubauer, 2002; Lamers, Ireland, Resnick, & Blum, 2000; and Miller, 2002) yet out of wedlock births are increasingly common and carry little social stigma to discourage them. The acceptance of adolescent sexual activity as inevitable if not undesirable is another. While feelings of invulnerability may impact, in part, adolescent sexual activity, the human ecological perspective, viewing the entire system and the many factors impacting adolescent development and behavior, must

not be overlooked. This perspective should guide future research looking at the environmental factors impacting adolescent sexual activity and potential intervention at all levels that could help decrease adolescent sexual activity.

This study took an important first step in trying to determine if feelings of invulnerability contribute to adolescent sexual activity. The cross-section survey design of this study made it difficult to interpret some of the unexpected results. Findings that indicated youth could perceive some risk and actually felt somewhat vulnerable to the consequences of sexual activity need to be put in context. Did youth have feelings of invulnerability initially and, only after engaging in sexual activity, realize their vulnerability? Or did some youth feel vulnerable, yet still engage in high risk behavior? The answer to theses questions makes a difference in planning interventions to decrease adolescent sexual activity. If helping adolescents realize their vulnerability does not impact behavior are there additional interventions that can?

While the small sample size may have limited the number of relationships detected the results did show that perceived invulnerability had more impact on the sexual behavior of youth with more risk factors than it did for youth with fewer risk factors. This supports an ecological perspective of how interrelated these risk factors may be. Future studies with larger samples may be able to detect additional relationships that were not found in this study. Further exploration of the relationship of perceived invulnerability and sexual activity in adolescents to better determine the nature and strength of this relationship in other samples is desired. Keeping an ecological perspective allows continued consideration of the multiple factors

impacting adolescent sexual activity. Helping higher risk youth identify feelings of invulnerability to the potential consequences of sexual activity may be a useful intervention for decreasing adolescent sexual activity especially if used in conjunction with interventions aimed at other risk factors. Any attempted interventions to try and decrease feelings of invulnerability should be carefully studied.

APPENDIX A

Knoppers' Youth Assessment

This Questionnaire is being used to help identify youth beliefs, attitudes, opinions, problems, and strengths.

The results will help in planning future programs and services for young people in Kent County. All your answers are confidential, so please answer the questions thoughtfully and honestly. If you cannot answer a question honestly, please leave it blank.

Your participation is voluntary. You don't have to answer any questions you don't want to.

- Please follow the directions **mark** each answer carefully
- Raise your hand or ask for help if you need it.

Adaptations of the Dane County Youth Assessment 2000*

About Yourself
Mark the answer which **best describes you.**

1. Are you male or female? _____ Male _____ Female

2. To what racial or ethnic group do you belong?

_____ Native American Indian

_____ Black/African-American

_____ Hispanic

_____ Hmong

_____ Asian (Not Hmong)

_____ White (Not Hispanic)

_____ Mixed race (for example, part Hispanic and part White)

If Mixed, which races? _____

_____ Other, please list _____

3. How old are you?

_____ 12 or younger
_____ 13
_____ 14
_____ 15
_____ 16
_____ 17
_____ 18
_____ 19 or older

4. What is the average grade you usually get in your courses at school?

_____ Mostly As

_____ About half As & half Bs

_____ Mostly Bs

_____ About half Bs & half Cs

_____ Mostly Cs

_____ About half Cs & half Ds

_____ Mostly Ds

_____ Mostly below D

Your Living Situation
Answer these questions about **the adults you live with.**

5. Which best describes where you live the majority of the time?

_____ In the Grand Rapids metropolitan area

_____ In a smaller city (like Rockford, Lowell or Walker)

_____ In a small town or village (like Kent City, Cedar Springs, Sparta)

_____ In the country, not on a working farm

_____ On a working farm

6. Whom do you live with **most** of the time?

_____ Two parents (biological or adoptive)

_____ Mother and stepfather

_____ Father and stepmother

_____ With mother only

_____ With father only

_____ Half the time with my mother, half the time with my father (shared custody)

_____ With parent and another adult (non-relative)

_____ Group home or foster home

_____ With a relative (aunt, uncle, grandparents, etc.)

_____ I live alone or with friends

7. How much education did your mother/stepmother complete? Give your best guess if not sure.

_____ Elementary or junior high school

_____ High school

_____ Some college or technical school

_____ Graduated from a 2-year college or technical school

_____ Graduated from a 4-year college

_____ Some school beyond 4-year college

_____ Professional or graduate degree (Ph.D, M.D., M.A., law degree, etc)

_____ Don't know

8. How much education did your father/stepfather complete? Give your best guess if not sure.

_____ Elementary or junior high school

_____ High school

_____ Some college or technical school

_____ Graduated from a 2-year college or technical school

_____ Graduated from a 4-year college

_____ Some school beyond 4-year college

_____ Professional or graduate degree (Ph.D, M.D., M.A., law degree, etc)

_____ Don't know

9. Are your biologic (or adoptive if you are adopted) parents divorced or separated?

_____ Never divorced or separated

_____ Never married

_____ Divorced/separated within the last year

_____ Divorced/separated more than one year ago

Substance Use Past Year

Please indicate how often **you** have used the following **during the past year**

	Not At All 0	Once or Twice 1	1 to 3 Times a Month 2	1 to 3 Times a Week 3	4 to 6 Times a Week 4	Daily 5
10. Tobacco (smoking cigarettes, cigars, pipe, snuff, chewing)	0	1	2	3	4	5
11. Beer/wine/wine coolers, hard liquor	0	1	2	3	4	5
12. Marijuana	0	1	2	3	4	5
13. Other drugs (inhalants, hallucinogens, cocaine/crack, stimulants, steroids, another persons prescription drugs, etc.)	0	1	2	3	4	5

14. During the **past month**, have you had **5 or more** alcoholic drinks at one time? (A "drink" is a glass of wine or beer, a bottle or can of beer, a shot of liquor, or a mixed drink.)

_____ Never

_____ Yes, once

_____ Yes, twice

_____ Yes, 3 to 5 times

_____ Yes, 6 to 9 times

_____ Yes, 10 or more times

Personal Issues

Please indicate how much you agree or disagree with the following statements.

	Strongly Agree	Agree	Not Sure	Disagree	Strongly Disagree
	0	1	2	3	4
15. I will not get pregnant (or get my partner pregnant) if I have unprotected sexual intercourse	0	1	2	3	4
16. I will not get a sexual transmitted disease (such as Chlamydia, gonorrhea, HIV/AIDS, herpes, or human papilloma virus that causes genital warts) if I have unprotected sexual intercourse	0	1	2	3	4
17. My religion/religious beliefs are important to me	0	1	2	3	4

Which **best describes you.**

18. If you have ever been sexually active, how old were you the first time you voluntarily had sexual intercourse?

_____ I have never been sexually active
_____ 11 years old or younger
_____ 12 years old
_____ 13 years old
_____ 14 years old
_____ 15 years old
_____ 16 years old
_____ 17 years old
_____ 18 years old
_____ 19 years old or older

19. How often have you had sexual intercourse in the past 3 months?

_____ I have not been sexually active in the last 3 months
_____ 1 time
_____ 2 times
_____ 3 times
_____ 4 times
_____ 5 times
_____ 6 or more times

20. How many sexual partners have you had in your lifetime?

_____ I have not had any sexual partners

_____ 1 sexual partner

_____ 2 sexual partners

_____ 3 sexual partners

_____ 4 sexual partners

_____ 5 sexual partners

_____ 6 or more sexual partners

21. If you have ever been sexually active, how often were you drunk or high while having sexual intercourse?

_____ I have not had sexual intercourse

_____ Never

_____ Rarely

_____ Sometimes

_____ About half the time

_____ Most of the time

_____ Always

22. Have you ever been diagnosed or treated for a sexually transmitted disease (including HIV/AIDS, human papilloma virus/HPV/genital warts, Herpes, syphilis, gonorrhea, or Chlamydia)?

_____ No

_____ Yes, within the past year

_____ Yes, more than a year ago

23. If you have had sexual intercourse, how often do you and/or your partner use some form of birth control?

_____ I have not had sexual intercourse

_____ Never

_____ Rarely

_____ Sometimes

_____ About half the time

_____ Most of the time

_____ Always

24. Have you ever been pregnant or made someone pregnant?

_____ No

_____ Yes, within the past year

_____ Yes, more than a year ago

Please indicate how much you agree or disagree with the following statements.

	Strongly Agree 0	Agree 1	Not Sure 2	Disagree 3	Strongly Disagree 4
25. If I have unprotected sexual intercourse I could get pregnant (or get my partner pregnant)	0	1	2	3	4
26. If I have unprotected sexual intercourse I could get a sexual transmitted disease (such as chlamydia, gonorrhea, HIV/AIDS, herpes, or human papilloma virus that causes genital warts)	0	1	2	3	4
27. I am not very involved with religious activities	0	1	2	3	4

Which **best describes you.**

28. Have you ever been sexually abused by an adults? (*Sexual abuse is when someone in your family or another person does sexual things to you or makes you do sexual things to them.)*

_____ No

_____ I am currently being sexually abused

_____ I was sexually abused, but the abuse has stopped

29. Have you ever been physically abused by an adults (*e.g., beat up, hit with an object, kicked, or some other form of physical force)?*

_____ No

_____ I am currently being physically abused

_____ I was physically abused, but the abuse has stopped

30. Have you ever witnessed someone being beaten or physically abused?

_____ Never

_____ Yes, in my home

_____ Yes, in my school

_____ Yes, in my town

_____ Yes, in my home and at school

_____ Yes, in my school and town

_____ Yes, in all three of these places

Opinions About Your Community
Please read each statement carefully and decide whether you agree or disagree.

	Strongly Agree 0	Agree 1	Disagree 2	Strongly Disagree 3
31. If I had a problem, there are neighbors whom I could count on to help me.	0	1	2	3
32. If I were doing something wrong, adults in my community would probably tell my parent(s).	0	1	2	3
33. People in my community know and care about each other.	0	1	2	3

Your Family
Indicate how much of the following are true about the adults who live with you (e.g., your parents(s), stepparent, foster parent(s), or other guardian).

	Never 0	Rarely 1	Sometimes 2	Often 3	Very Often 4	No adults at Home 5
34. I tell them whom I'm going to be with before I go out.	0	1	2	3	4	5
35. I talk to them about the plans I have with my friends.	0	1	2	3	4	5
36. When I go out they ask me where I'm going	0	1	2	3	4	5
37. They usually know what I am doing after school.	0	1	2	3	4	5

Indicate how much of the following are true for you. (Answers these questions about **either** your parent(s) **or** the adults who live with you).

	Never 0	Rarely 1	Sometimes 2	Often 3	Very Often 4	No adults at Home 5
38. My parent(s) are there when I need them.	0	1	2	3	4	5
39. My parent(s) care about me.	0	1	2	3	4	5

Please indicate how much you agree or disagree with the following statements.

	Strongly Agree 0	Agree 1	Not Sure 2	Disagree 3	Strongly Disagree 4
40. My parent(s) think it is wrong for teens my age to have sexual intercourse.	0	1	2	3	4
41. My parent(s) think it is wrong for teens my age to drink alcohol.	0	1	2	3	4

Your Friends and Views

Please indicate how much you agree or disagree with the following statements.

	Strongly Agree 0	Agree 1	Disagree 2	Strongly Disagree 3
42. My friends help me to stay out of trouble	0	1	2	3
43. Most of my friends **do not** have sexual intercourse	0	1	2	3
44. Most of my friends **do not** drink or do drugs	0	1	2	3
45. Most of my friends **do not** smoke cigarettes or chew tobacco	0	1	2	3
46. I believe teenagers should **not** be having sexual intercourse.	0	1	2	3

Please continue to the last page and thank you for your help!

Vulnerability Questions from The New Personal Fable Scale **

Please indicate how much you agree or disagree with the following statements.

	Strongly Agree 0	Agree 1	Not Sure 2	Disagree 3	Strongly Disagree 4
47. Nothing seems to really bother me.	0	1	2	3	4
48. I don't believe in taking chances.	0	1	2	3	4
49. I am a fragile person.	0	1	2	3	4
50. I believe in knowing how something will turn out before I try it.	0	1	2	3	4
51. I believe in taking risks.	0	1	2	3	4
52. There are times when I think that I'm indestructible.	0	1	2	3	4
53. I can get away with things that other people can't.	0	1	2	3	4
54. It is impossible for people to hurt my feelings.	0	1	2	3	4
55. My feelings are easily hurt.	0	1	2	3	4
56. Special problems, like using drugs or becoming pregnant could never happen to me.	0	1	2	3	4
57. I enjoy taking risks.	0	1	2	3	4
58. It is easy to take risks because I never get hurt.	0	1	2	3	4
59. I don't take chances because I usually get in trouble.	0	1	2	3	4
60. I am not afraid to do dangerous things.	0	1	2	3	4

* Adaptation of the Dane County Youth Assessment used with permission of Steven Small, University of Wisconsin **Vulnerability Subscale of the New Personal Fable Scale from Lapsley, D. K., FitzGerald, D. P., Rice, K. G., & Jackson, S. (1989). Separation-individualtion and the "new look" at the imaginary audience and personal fable: A test of an integrative model. Journal of Adolescent Research, 4, 483-505.

APPENDIX B

Permission for The Youth Assessment Survey on
Perceptions of Invulnerability and Adolescent Sexual Activity

Dear Parent(s)/guardian(s),

This is an invitation for your child to participate in a study to look at some of the factors that influence adolescent sexual activity. Your child's participation in this study will help us better understand these factors so that we can improve interventions to postpone sexual activity in adolescents.

Your child's participation in this study is voluntary and limited to one survey that should take only about 10-15 minutes to complete. If your child feels uncomfortable with any question on the survey the question may be left blank and your child may choose to stop filling out the survey at any time. To better understand the many factors that may impact adolescent sexual activity the survey includes sensitive topics including questions about drug use and abuse. Your child's name will not be on the survey. All answers are confidential. Results will be reported for groups of participants only. Your child's privacy will be protected to the maximum extent allowable by law.

If you have any questions about this study please contact the investigators, Sherry Knoppers at 887-0875 or sknopper@grcc.edu or Lawrence Schiamberg at (517) 432-8293 or schiambe@msu.edu. If you have questions or concerns regarding the rights of your child as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact – anonymously, if you wish – Peter Vasilenko, Ph.D., Chair of the University Committee on Research Involving Human Subjects (UCRIHS) by phone: (517) 355-2180, fax: (517) 432-4503, e-mail: ucrihs@msu.edu, or regular mail: 202 Olds Hall, East Lansing, MI 48824.

Your signature below indicates your voluntary agreement to allow your child to participate. Your child's signature indicates your child's willingness to participate as well.

.....

I _____ give permission for _____ to participate
parent/guardian's name child's name

In the Youth Assessment Survey _____ _____
parent/guardian's signature today's date

I _____ am willing to participate in this survey _____
child/youth's name today's date

APPENDIX C

Permission for The Youth Assessment Survey on
Perceptions of Invulnerability and Adolescent Sexual Activity

Dear Participant

This is an invitation for you to participate in a study to look at some of the factors that influence adolescent sexual activity. Your participation in this study will help us better understand these factors so that we can improve interventions to postpone sexual activity in adolescents.

Your participation in this study is voluntary and limited to one survey that should take only about 10-15 minutes to complete. If you feel uncomfortable with any question on the survey the question may be left blank and you may choose to stop filling out the survey at any time. To better understand the many factors that may impact adolescent sexual activity the survey includes sensitive topics including questions about drug use and abuse. Your name will not be on the survey. All answers are confidential. Results will be reported for groups of participants only. Your privacy will be protected to the maximum extent allowable by law.

If you have any questions about this study please contact the investigators, Sherry Knoppers at 887-0875 or sknopper@grcc.edu or Lawrence Schiamberg at (517) 432-8293 or schiambe@msu.edu. If you have questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact – anonymously, if you wish – Peter Vasilenko, Ph.D., Chair of the University Committee on Research Involving Human Subjects (UCRIHS) by phone: (517) 355-2180, fax: (517) 432-4503, e-mail: ucrihs@msu.edu, or regular mail: 202 Olds Hall, East Lansing, MI 48824.

Your signature below indicates your voluntary agreement to to participate.

.....

I _____ am willing to participate in this survey _____
name today's date

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